Vol. 1068 Number 1

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

July 1, 1986

U.S.
DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

July 1, 1986 Volume 1068 Number 1

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1068 OG 2
Board of Appeals Decisions Rendered	1068 OG 2
Notice of Maintenance Fees Payable	1068 OG 2
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees	1068 OG 3
Reissue Applications Filed	1068 OG 3
Requests for Reexaminations Filed	1068 OG 3
Patent Term Extended Under 35 USC 156	1068 OG 3
Service by Publication	1068 OG 3
Patent Certificates of Correction	1068 OG 4
Disclaimers	1068 OG 4
Dedication	1068 OG 4
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1068 OG 5
Condition of Patent Applications	1068 OG 6
Statutory Invention Registrations	1
Defensive Patent Publication (106,801)	7
Reissue Patents Granted (32,195)	9
Plant Patents Granted (5,756)	11
Patents Granted	
General and Mechanical (4,597,108)	13
Chemical (4,597,768)	245
Electrical (4,598,163)	355
Design Patents Granted (284,420)	451
Index of Patentees	PI 1
Indices of Reissue, Design, Plant Patentees and Statutory Invention Registrations	PI 49
Index of Defensive Publications	PI 53
Classification of	
Patents (Including Reissues)	PI 55
Designs, Plants, Statutory Invention Registration Applications and Defensive Publications	PI 58
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 59
Designs, Plants, Statutory Invention Registration Applications and Applicants of Defensive Publications	PI 61
Change of Address Form and Subscription Order Form	Back Page

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Feb. 9, 1986 and is announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

International PCT fees have been changed effective Jan. 1, 1986 and were announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

Note that the amount of the international search fee for the European Patent Office and the amounts of the International PCT fees will change effective June 1, 1986. For information on these fee changes see the notice appearing in the *Official Gazette* at 1065 O.G. 41 on Apr. 29, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
if paid before June 1, 1986	830.00
if paid on or after June 1, 1986	930.00
International fees	
Basic fee (first 30 pages):	
if paid before June 1, 1986	325.00
if paid on or after June 1, 1986	375.00
Basic Supplemental fee (for each page over 30):	
if paid before June 1, 1986	6.00
if paid on or after June 1, 1986	7.00
Designation fee for the first 10 national or regional offices:	
if paid before June 1, 1986	80.00
if paid on or after June 1, 1986	90.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Mar. 31, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Board of Appeals Decisions Rendered in the Month of May 1986

Affirmed	182
Affirmed in Part	24
Reversed	95
Total	301

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on June 28, 1983, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,389,733 through 4,390,994
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, th e patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED APRIL 13, 1986, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,324,202	06/240,352	4/13/82
4,324,223	06/221,382	4/13/82
4,324,279	06/228,110	4/13/82
4,324,519	06/239,014	4/13/82
4,324,602	06/216,871	4/13/82
4,324,664	06/254,842	4/13/82
4,324,671	06/233,277	4/13/82
4,324,673	06/225,548	4/13/82
4,324,704	06/238,680	4/13/82
4,324,740	06/240,394	4/13/82
4,324,760	06/249,791	4/13/82
4,324,761	06/249,790	4/13/82
4,324,763	06/256,826	4/13/82
4,324,821	06/221,518	4/13/82
4,324,884	06/277,994	4/13/82
4,324,900	06/248,176	4/13/82
4,324,939	06/223,618	4/13/82
4,324,977	06/225,568	4/13/82
4,324,984	06/231,055	4/13/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,067,103, Re. S.N. 851,521, Filed Apr. 11, 1986, Cl. 29/623, METHOD OF MAKING A PLUG IN FUSE, Allen L. Ciesmier, et al., Owner of Record: *Littelfuse, Inc., Des Plaines, Ill.,* Attorney or Agent: Russell E. Hattis, Ex. Gp.: 326

4,472,371, Re. S.N. 825,367, Filed Feb. 3, 1986, Cl. 424/1.1, RADIOLABELED ANTIBODY TO ANTI-TUMOR ASSOCIATED ANTIGEN AND PROCESS, Scott W. Burchiel, et al., Owner of Record: *Summa Medical Corp., Albuquerque, N.Mex.,* Attorney or Agent: Paul J. Cook, Ex. Gp.: 128

4,490,068, Re. S.N. 842,223, Filed Mar. 21, 1986, Cl. 404/006, HYDRAULIC SAFETY BARRIER TRAFFIC WAY CONTROLLER, Harry D. Dickinson, Owner of Record: *Inventor,* Attorney or Agent: John E. Wagner, Ex. Gp.: 356

4,500,458, Re. S.N. 858,660, Filed May 1, 1986, Cl. 260/351.5, PROCESS FOR THE PREPARATION OF a-6-DEOXYTETRACYCLINES, Ivan Villax, et al., Owner of Record: *Plurichemie Anstalty, Vaduz, Liechtenstein,* Attorney or Agent: Bernard Gerb, et al., Ex. Gp.: 129

4,508,363, Re. S.N. 829,610, Filed Feb. 14, 1986, Cl. 280/808, ADJUSTABLE SEAT BELT ANCHORAGE, John D. Temple, Owner of Record: *ASE (UK) Ltd., Cumbria, England,* Attorney or Agent: Robert J. Patch, et al., Ex. Gp.: 316

4,537,267, Re. S.N. 832,546, Filed Feb. 24, 1986, Cl. 180/9.1, BELT TENSIONING MECHANISM, Ronald L. Satzler, Owner of Record: *Caterpillar Tractor Co., Peoria, Ill.,* Attorney or Agent: J. W. Burrows, et al., Ex. Gp.: 316

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Patent Term Extended Under 35 USC 156

A certificate extending the term of the following patent was issued under the provisions of 35 U.S.C. 156 on May 23, 1986.

Patent No. 3,957,764, granted May 18, 1976 to Lund, owner of record: Lovens Kemiske Fabrik Produktionsaxtieselskab. Term extended two (2) years.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Burleigh Brooks Optics, Inc., Hackensack, N.J., Reg. No. 633,989, for the mark "NOVOFLEX", Canc. No. 15,207.

Chadco, Inc., Washington, D.C. Reg. No. 1,211,375, for the mark "MILEAGE-MIZER", Canc. No. 15,328.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

PATENT NOTICES

Certificates of Correction for the Week of July 1, 1986

PP. 4,434	4,544,818	4,567,619	4,575,296
Re. 31,824	4,545,390	4,568,490	4,575,445
Re. 32,016	4,545,773	4,568,684	4,575,665
D. 278,610	4,547,369	4,569,019	4,575,799
3,836,598	4,550,237	4,569,025	4,575,918
4,317,817	4,551,000	4,569,076	4,575,933
4,426,191	4,551,409	4,569,246	4,576,157
4,441,170	4,552,466	4,569,268	4,576,537
4,478,343	4,555,919	4,569,329	4,576,556
4,489,149	4,556,636	4,569,640	4,576,678
4,489,817	4,557,317	4,569,818	4,576,889
4,490,538	4,557,396	4,569,842	4,577,031
4,503,055	4,557,434	4,569,846	4,578,111
4,503,263	4,557,862	4,569,895	4,578,156
4,505,840	4,558,282	4,569,917	4,578,443
4,508,463	4,559,441	4,570,059	4,578,763
4,511,188	4,560,355	4,570,268	4,578,780
4,515,625	4,560,892	4,570,301	4,578,782
4,515,889	4,561,205	4,571,108	4,578,880
4,517,879	4,561,328	4,571,565	4,578,942
4,522,009	4,561,863	4,572,177	4,579,069
4,527,065	4,561,915	4,572,210	4,579,187
4,531,963	4,562,485	4,572,246	4,579,386
4,536,277	4,562,569	4,572,506	4,579,747
4,536,816	4,564,030	4,572,655	4,579,758
4,538,843	4,564,103	4,572,749	4,579,996
4,542,014	4,564,174	4,573,239	4,580,086
4,543,138	4,564,205	4,573,250	4,580,716
4,543,760	4,565,739	4,573,293	4,580,751
4,543,766	4,565,857	4,573,542	4,580,852
4,543,957	4,565,994	4,574,083	4,581,110
4,544,181	4,566,073	4,574,208	4,581,431
4,544,624	4,566,371	4,574,283	4,581,517
4,544,635	4,567,408	4,575,067	4,581,580

Disclaimers

4,016,821.—*Philip Francis Minalaga,* Piscataway, N.J. ELECTRONIC CONTROL OF BIGHT, FEED AND FEED BALANCE IN A SEWING MACHINE. Patent dated Apr. 12, 1977. Disclaimer filed May 2, 1986, by the assignee, *The Singer Co.*

Hereby enters this disclaimer to claim 11 of said patent.

4,285,165.—*George F. Kirkpatrick,* Downers Grove, Ill. COLORED INTERLOCKING CLOSURE STRIPS. Patent dated Aug. 25, 1981. Disclaimer filed Apr. 2, 1986, by the assignee, *Union Carbide Corp.*

Hereby enters this disclaimer to all claims of said patent.

4,521,215.—*William J. Kaufman,* Penn Township, Lancaster County; *Pamela H. Martin,* Warwick Township, Lancaster, both of Pa. POLYVINYL CHLORIDE RESIN PARTICLES DYED WITH CATIONIC DYE-STUFFS AND PROCESS OF PREPARATION. Patent dated June 4, 1985. Disclaimer filed Apr. 21, 1986, by the assignee, *Armstrong World Industries, Inc.*

Hereby enters this disclaimer to claims 1–3 and 6–9 of said patent.

4,577,418.—*Charles E. Nagy,* Glendale, Calif. SHOE PROTECTOR. Patent dated Mar. 25, 1986. Disclaimer filed Apr. 7, 1986, by the *inventor.*

Hereby enters this disclaimer to claims 2 and 5 of said patent.

Dedication

Re. 30,754.—*Clarence F. Hammer,* Wilmington, Del. and *Harold K. Sinclair,* Louisville, Ky. PROCESS FOR THE PREPARATION OF GRAFT COPOLYMERS. Patent dated Sept. 29, 1981. Dedication filed May 6, 1986, by the assignee, *E. I. du Pont de Nemours and Co.*

Hereby dedicates to the public the entire remaining term of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2432
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	The Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF May 24, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	4-01-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-01-85
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	10-12-84
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	4-18-84
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	2-17-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	11-21-83
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	2-01-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	3-28-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	9-26-83
DESIGN, GROUP 290—K. L. CAGE, Director	2-06-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	12-24-84
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	8-18-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	4-25-84
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	7-01-85

Expiration of patents: The patents within the range of numbers indicated below expire during May 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents. issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,441,960 to 3,447,159, inclusive

Plant Patents ..... Numbers 2,882 to 2,889 inclusive

STATUTORY INVENTION REGISTRATIONS

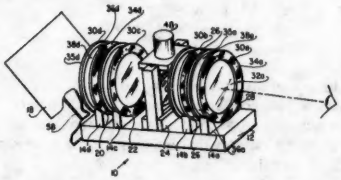
PUBLISHED JULY 1, 1986

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H76
INSTRUCTIONAL POLARISCOPE

Bruce W. Cotterman, West Point, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 10, 1983, Ser. No. 465,377
Int. Cl.[4] G01B *11/18*; G01J *4/00*
U.S. Cl. 356—33 **3 Claims**



1. A dismountable instructional polariscope for analyzing stresses in a birefingent specimen, said polariscope being adapted to be dismounted without tools, comprising:

a base having a viewing end and a light-source end opposite said viewing end,

a load cell fixedly mounted on said base for holding said specimen,

means associated with said load cell for creating stresses in said specimen,

a polarizer comprising a first annular frame formed with a first peripheral groove and having a first hole at the center of said first annular frame, and a lens of polarizing material attached to said first annular frame for covering said first hole,

an analyzer comprising a second annular frame formed with a second peripheral groove and having a second hole at the center of said second annular frame, and a lens of polarizing material attached to said second annular frame for covering said second hole,

a first support, fixed to said base intermediate said light-source end and said load cell, and formed with a concave surface to slidably and detachably receive said first peripheral groove of said polarizer for rotation thereon solely by hand, and to support said polarizer thereon solely by gravity,

a second support, fixed to said base intermediate said viewing end and said load cell, and formed with a concave surface to slidably and detachably receive said second groove of said analyzer for rotation thereon solely by hand, and to support said analyzer thereon solely by gravity,

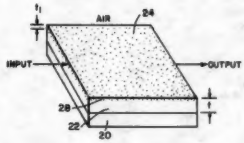
said base, said load cell, said annular frames, and said supports comprising wood, and

a light reflector, detachably disposed solely by gravity adjacent said light-source end of said base, for directing light through said polarizer, said specimen, and said analyzer.

H77
LOW LOSS, SINGLE-MODE PLANAR WAVEGUIDE

Shi-Kay Yao, Anaheim, and Joseph W. Niesen, Placentia, both of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 1, 1983, Ser. No. 481,125
Int. Cl.[4] G02B *6/10*
U.S. Cl. 350—96.12 **10 Claims**



1. A method of making a single-mode planar waveguide comprising the steps of:

depositing a layer of high index refractive material as a substrate,

thermally oxidizing a layer of silicon dioxide onto a surface of said substrate for providing a single-mode waveguide thereon,

depositing a layer of lead on to the exposed surface of said silicon dioxide waveguide,

oxidizing said lead, and

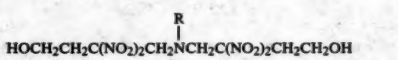
uniformly diffusing all of said oxidized lead a predetermined distance into said silicon dioxide waveguide less than two-fifths of the thickness of the waveguide.

H78
5-AZA-3,3,7,7-TETRANITRONONANE-1,9-DIOLS AND METHOD OF PREPARATION

Horst G. Adolph, Silver Spring, and Michael E. Sitzmann, Adelphi, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 6, 1983, Ser. No. 492,276
Int. Cl.[4] C07C *69/76*
U.S. Cl. 560—110 **22 Claims**

1. A compound of the formula



wherein R is selected from the group consisting of —H, —NO, —NO_2, —CN, and —CH_2COOH.

H79
MAGNETIC RECORDING DISK CARTRIDGE

Michael A. Bartholet, 900C W. Moorhead Cr., Boulder, Colo. 80303, and Marvin E. Prahl, 6635 Cherokee Ct., Longmont, Colo. 80501

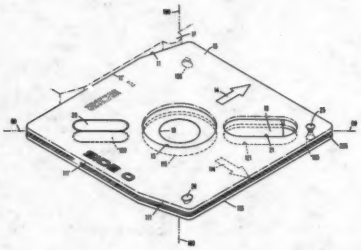
Filed May 23, 1983, Ser. No. 497,322
Int. Cl.[4] G11B *23/02*
U.S. Cl. 360—133 **18 Claims**

1. A diskette, adapted for use with a disk drive having head means which operates on one or the other, but not simultaneously on both sides of a double-sided floppy disk which is enclosed within a thin, flat, generally square housing having four corners, said housing having a diagonal axis which crosses

first and second opposite corners of said housing, and having an orthogonal axis which is perpendicular to said diagonal axis and crosses third and fourth opposite corners of said housing, the housing and its internal disk constituting said diskette; said diskette including:

a pair of elongated and oppositely-aligned head-access openings, one on each flat surface of said housing; said head-access openings being located on said diagonal axis adjacent said first corner, and being spaced to one side of a centrally located disk-drive opening;

two-pair of diskette locating means, one pair for each flat surface of said housing, first ones of each of said pair being symmetrically-aligned on said diagonal axis adjacent said first corner, second ones of each of said pair being symmetrically located on said orthogonal axis adjacent said third and fourth corners, and on opposite flat surfaces of said housing;



a first and second polarizing means carried by said housing, one at each of said third and fourth corners;

whereby the disk may be oriented for use of one side or the other by rotating said housing 180° about said diagonal axis;

such that said first and second corners of said housing occupy the same position within a disk drive for each of the two rotated positions of said housing, and different ones of said third and fourth corners occupy an operative position within the disk drive, for each of said two rotated positions.

H80
LIGHTWEIGHT CRYOGENIC TANK WITH POSITIVE EXPULSION

Joseph C. Lewis, Lacanada, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 12, 1984, Ser. No. 630,148
Int. Cl.[4] B65D *35/22*
U.S. Cl. 222—95 **7 Claims**

1. A tank structure for the storage and controlled expulsion therefrom of a cryogenic liquid, comprising:

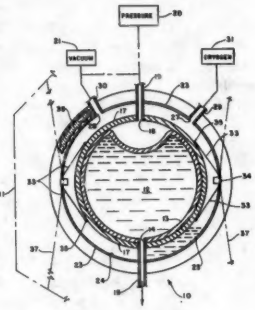
(a) a first container in the form of a flexible metallic bladder having a wall thickness of from about 0.25 to about 3.0 millimeters defining an interior collapsible volume of predetermined size in a fully expanded condition for containing said liquid said bladder being substantially totally collapsible within itself upon expulsion of said liquid;

(b) a second container surrounding and providing the sole structural support for said first container and defining an interior volume of size and shape conforming substantially to that of said first container in said fully expanded condition;

(c) a third container surrounding said second container;

(d) a plurality of struts connected between the outer surface of said second container and the inner surface of said third container for supporting said second container within said third container in a spaced relationship to said third container;

(e) first fluid conducting conduit means operatively connected to said first container, communicating with said collapsible volume, and extending outwardly through said second and third containers, through which said cryogenic liquid may be inserted into said first container and conducted therefrom;



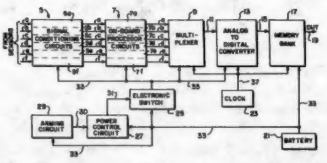
(f) a source of pressurized gas; and

(g) second fluid conducting conduit means operatively interconnecting said second container and said source, for controllably supplying said gas to the interior of said second container.

H81
PROJECTILE GUIDANCE RECORDING SYSTEM

Louis R. Szabo, Landing, and William I. Osborne, Morris Plains, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 24, 1984, Ser. No. 653,263
Int. Cl.[4] G01D *9/00*; G01L *5/14*
U.S. Cl. 346—38 **8 Claims**

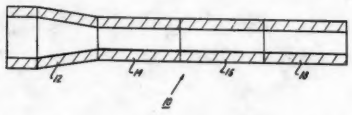


1. A recording system adapted to be carried by a projectile during test flights and to gather data from sensors carried by said projectile, comprising; a plurality of sensors located on said projectile, circuit means to process and digitize the outputs of said sensors, and further circuit means to store said digitized sensor outputs in a solid state digital memory.

H82
COMPOSITE GUN BARRELS

William A. Dittrich, Denville, N.J., and Roger Stanton, Stroudsburg, Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 26, 1984, Ser. No. 654,425
Int. Cl.[4] F41C *21/02;* F41F *17/08;* F16L *9/22*
U.S. Cl. 42—76 A 4 Claims



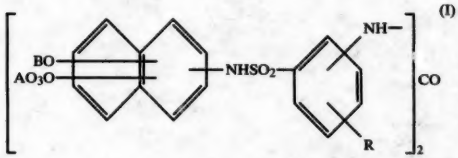
1. A generally cylindrical gun barrel comprising at least two elongate sections of differing physical properties joined together by friction welding.

H83
DENTAL ANTIPLAQUE AGENTS AND INHIBITORS OF CONNECTIVE TISSUE DESTRUCTION

John F. Poletto, Westwood, N.J., and Seymour Bernstein, New City, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 11, 1985, Ser. No. 710,771
Int. Cl.[4] A61F *7/16*
U.S. Cl. 424—49 12 Claims

1. A compound of the formula:

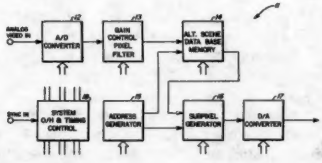


wherein A is hydrogen or a pharmaceutically acceptable salt cation; B is hydrogen, lower(C_1–C_6)alkanoyl or alkali metal; and R is hydrogen or lower(C_1–C_3)alkyl.

H84
REAL-TIME POLAR CONTROLLED VIDEO PROCESSOR

Jon H. Bumgardner, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 23, 1985, Ser. No. 737,136
Int. Cl.[4] H04N *7/01, 5/14*
U.S. Cl. 358—140 8 Claims

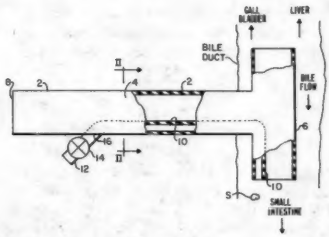


1. A real-time polar controlled video processor comprising:
an analog-to-digital converter;
a gain-controlled pixel filter connected to said analog-to-digital converter;
an alternating scene database memory connected to said gain-controlled pixel filter;
a subpixel generator connected to said alternating scene database memory;
an address generator connected to said alternating scene database memory and to said subpixel generator; and
a digital-to-analog converter connected to said subpixel generator.

H85
BILE TUBE ASSEMBLY

Michael J. Shortsleeve, 753 Concord Ave., Belmont, Mass. 02178

Filed May 30, 1985, Ser. No. 739,189
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—284 5 Claims



1. A bile tube assembly comprising a first conduit having an elongated flexible tubular stem portion and at one end thereof an elongated flexible tubular head portion, the interior of the stem portion being in communication with the interior of the head portion, the head portion being adapted for disposition in a bile duct, and a second flexible conduit smaller in cross-sectional area than said first conduit, said second conduit being co-extensive with and fixed to an interior wall of said first conduit stem portion and to an interior wall of said first conduit head portion, whereby to facilitate conveyance of fluid from an external source through said second conduit and into said bile duct, while permitting, simultaneously, egress of bile from said bile duct through said first conduit head portion and stem portion to a distal end of said first conduit stem portion.

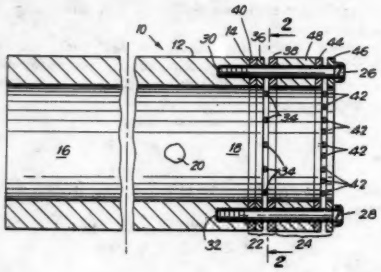
H86
ARRANGEMENT FOR COUNTERACTING SHOCK TUBE RAREFACTION WAVES

Charles N. Kingery, Aberdeen, and George A. Coulter, Colora, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 2, 1985, Ser. No. 751,100
Int. Cl.[4] G01N *3/30*
U.S. Cl. 73—12 8 Claims

1. A free-field simulator for determining the effects of an air blast on a test object located within a shock tube of the type wherein a shock wave travels past the test object in a path along the shock tube toward and beyond a discharge end of the same, and a rarefaction wave travels away from the discharge end into and along the shock tube in a countercurrent direction along the path to the test object, said rarefaction wave having an underpressure magnitude of one sense, comprising:
means for generating a reflected wave and for directing the same along the countercurrent direction of the path to the test object, said generating means including adjustment means for adjusting the magnitude of the reflected wave to have an overpressure magnitude which is substantially of the same magnitude as the underpressure magnitude of the rarefaction wave, but of an opposite sense; and
timing means for adjustably timing the reflected wave to

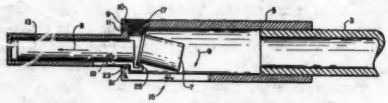
arrive at the test object at substantially the same time that the rarefaction wave arrives thereat, for causing the reflected wave to tend to counteract the effects of the rarefaction wave in the circumambient region of the test object and reliably simulate a free field thereat.



H87
ONE PIECE EJECTOR/EJECTOR SPRING FOR CARTRIDGE FIRING WEAPONS

George L. Reynolds, Altona, Ill., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 514,430, Jul. 18, 1983, abandoned. This application Jul. 15, 1985, Ser. No. 754,548
Int. Cl.[4] F41C *15/00*
U.S. Cl. 42—25 3 Claims



1. A semi-automatic grenade launcher for firing a cartridge having a case provided with a rim, said lauacher including a receiver provided with a reciprocal non-locking bolt and a port, an extractor mounted on said bolt for engagement with said rim after firing said case, and a solid elongate piece of elastic nylon secured to said receiver opposite said port, having an axis perpendicular to said reciprocating bolt for striking engagement with said rim of said cartridge, for ejection through said port.

H88
AMMUNITION BOLT FOR A FIREARM, HAVING IMPROVED SHAPED LOCKING LUGS THEREON

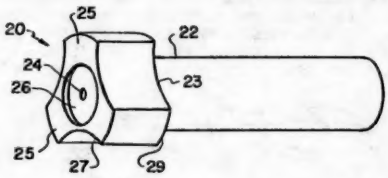
Giulio V. Savioli, Andover, N.J., and Kevin T. Bauer, Warwick, N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 9, 1985, Ser. No. 764,022
Int. Cl.[4] F41C *11/06*
U.S. Cl. 42—16 5 Claims

1. A firearm bolt comprising:

a cylindrical base having a maximum outer diameter and lying on a longitudinal axis; and

a plurality of mutually spaced locking lugs connected to said base and extending radially outwardly from said base with respect to said longitudinal axis, each locking lug having sidewalls which extend smoothly from one locking lug to a next locking lug around said base, said side surfaces

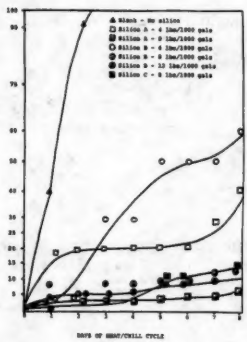


being concavely curved toward said base whereby each lug has a broad area of connection with said base.

H89
APPLE JUICE CLARIFICATION BY USING SILICA HYDROGELS

Cathy L. Harville, Glen Burnie, and Thomas E. Williams, Pasadena, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Aug. 20, 1985, Ser. No. 767,993
Int. Cl.[4] A23L *2/00*; C12H *1/00*
U.S. Cl. 426—423 4 Claims



1. In the process of preparing apple juices a method of clarifying and stabilizing said juices against haze formation without altering color and pH comprising the steps of contacting said beverages with silica hydrogel and subsequently filtering the beverages through a diatomaceous earth filtering medium.

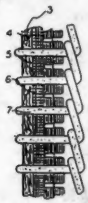
H90
STITCH-BONDED SPLIT-FILM FABRIC

Vijayendra Kumar, 15 The Strand, New Castle, Del. 19720

Filed Aug. 23, 1985, Ser. No. 769,205
Int. Cl.[4] D04B *23/08*
U.S. Cl. 66—192 8 Claims

1. In a stitch-bonded fabric which includes a layer of nonwoven sheet and layers of split film of synthetic organic polymer, the split film providing one layer which forms a warp component and two layers arranged in zig-zag face-to-face relationship which form a weft component, the warp and weft components being held together by parallel rows of stitches formed

by stitching yarn, the improvement comprising the nonwoven sheet being composed essentially of continuous filaments of



synthetic organic polymer and being attached to warp layer to form an outer layer of the stitch-bonded fabric.

H91

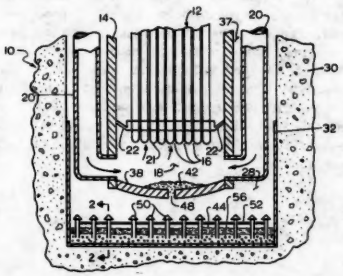
SAFETY APPARATUS FOR NUCLEAR REACTOR TO PREVENT STRUCTURAL DAMAGE FROM OVERHEATING BY CORE DEBRIS

John D. Gabor, Western Springs; John C. Cassulo, Stickney; Dean R. Pedersen, Naperville, and Louis Baker, Jr., Downers Grove, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 472,368, Mar. 4, 1983, abandoned. This application Sep. 20, 1985, Ser. No. 777,875

Int. Cl.⁴ G21C *9/00*

U.S. Cl. 376—280 **9 Claims**



1. A nuclear reactor comprising a core and a confinement vessel surrounding the core, fuel means in the core, liquid coolant for circulating over the fuel means and through the core, and a apparatus within the confinement vessel for minimizing structural damage to the reactor in the event of a reactor overheating malfunctioning accompanied by discharge of debris from the core, said apparatus comprising a bed of particles with diameters essentially in the range of 1–20 mm, on a lower surface in the containment vessel and located beneath the reactor core, the bed being porous to allow vapor to be passed laterally through it, and a plurality of elongated, tubular elements, each having an interior passageway, disposed with the lower ends thereof terminating within the porous bed and the upper ends, thereof terminating in the reactor confinement at an elevation above the bed of particles but beneath the reactor core whereby vapor can be vented from the porous bed.

H92

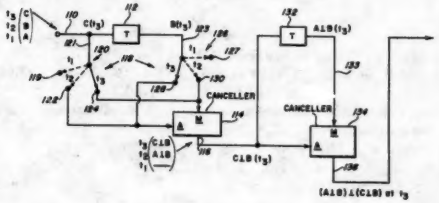
GENERALIZED ADAPTIVE MTI SYSTEM

Frank F. Kretschmer, Jr., Laurel, Md., and Bernard L. Lewis, Satellite Beach, Fla., assignors to United States of America, Washington, D.C.

Filed Sep. 23, 1985, Ser. No. 778,834

Int. Cl.⁴ G01S *13/52*; H01Q *3/22*

U.S. Cl. 343—7.7 **5 Claims**



5. A method for decorrelating a pulse in a multi-pulse MTI with a minimum of hardware, comprising the steps of:

obtaining three consecutive pulses A, B, and C, separated from each other by the MTI interpulse period T;

applying pulses A and B simultaneouly to the main and auxiliary inputs, respectively, of a single first adaptive canceller;

decorrelating pulse A from pulse B to yield A⊥B;

applying pulses C and B simultaneously to said main and auxiliary inputs of said single first adaptive canceller one interpulse period later;

decorrelating C from B to yield C⊥B;

applying A⊥B and C⊥B simultaneouly to the main and auxiliary inputs, respectively, of a second single adaptive canceller; and

decorrelating A⊥B from C⊥B to yield (A⊥B)⊥(C⊥B).

H93

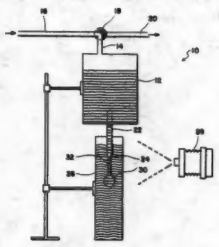
ELONGATIONAL RHEOMETER

Joseph E. Matta, Bel Air, and Jeffrey L. Harris, Edgewood, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 23, 1985, Ser. No. 779,325

Int. Cl.⁴ G01N *11/04*

U.S. Cl. 73—56 **4 Claims**



1. A method of measuring elongational viscosity of a test fluid comprising:

extruding the test fluid vertically downwardly through a capillary tube into a host fluid to form a spherical drop of the test fluid at a lower open end of the capillary tube in the host fluid;

continuing to extrude the test fluid through the capillary tube so that said spherical drop grows, then falls in the host fluid and away from the capillary tube, the drop being connected to the capillary tube by a stretching trailing ligament of the test fluid, and then the ligament breaks in the host fluid;

taking time sequence pictures of the drop as it is formed, grows and falls, and as the ligament stretches and breaks; and

analyzing the time sequence pictures to determine the falling velocity of the drop and the radial ligament velocity of the ligament which are used to calculate the elongated viscosity of the test fluid.

H94

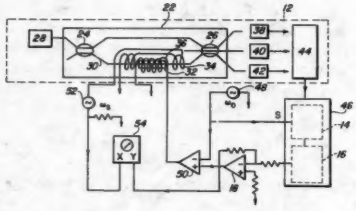
HIGH STABILITY FIBER OPTIC MAGNETIC FIELD SENSOR WITH ENHANCED LINEAR RANGE USING MAGNETIC FEEDBACK NULLING

Kee P. Koo, Alexandria, Va., assignor to United States of America, Washington, D.C.

Filed Nov. 7, 1985, Ser. No. 795,949

Int. Cl.[4] H01J 5/16

U.S. Cl. 250—227 11 Claims



1. An apparatus for increasing sensing linearity and dynamic range of a fiber optic interferometer-type magnetic field sensor, comprising:

a magnetostrictive square law sensing element;

means for generating a reference magnetic bias signal having a reference frequency greater than a magnetic measured field signal;

means for sensing said reference signal and said measured signal with said sensing element to form an interferometer output signal;

means for detecting said interferometer output signal to form an electrical detection signal;

means for mixing said detection signal with a mixer signal having said reference frequency to form a square law mixer output signal;

means for low pass filtering said mixer output signal below said reference frequency to form a baseband output signal of frequency less than said reference frequency;

means for amplifying said baseband output signal to form an electrical feedback signal;

means for converting said electrical feedback signal to a magnetic signal of opposed polarity to said measured signal; and

means for sensing said feedback signal with said sensing element to form a linearized interferometer output signal.

H95

HETEROJUNCTION D^-(OR A^+) MILLIMETER AND SUBMILLIMETER WAVE DETECTOR

Benjamin V. Shanabrook, Alexandria, Va., and William J. Moore, Silver Spring, Md., assignors to United States of America, Washington, D.C.

Filed Nov. 27, 1985, Ser. No. 802,286

Int. Cl.[4] H01L 31/00, 45/00

U.S. Cl. 357—30 15 Claims

1. A solid state detector for submillimeter and millimeter wave detection, which utilize no optical bias, comprising:

a semiconductor superlattice comprising alternating thin epitaxial layers of at least two different semiconductor materials, with said at least two different alternating materials having different bandgaps with the intrinsic bandgap difference therebetween being greater than KT, where K is the Boltzmann constant and T is the detector operating temperature, wherein said at least two semiconductor materials are doped with dopant molecules of the same conductivity type, such that some carriers resulting from said doping transfer from one of said doped thin epitaxial layers to an adjacent doped thin epitaxial layer and become weakly bound to a dopant molecule in said adjacent doped layer.

DEFENSIVE PUBLICATIONS

PUBLISHED JULY 1, 1986

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T106,801

METHOD TO IMPROVE ACIDULATION QUALITY OF IDAHO PHOSPHATE ROCK

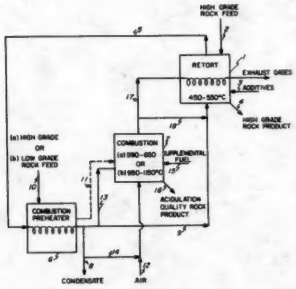
Alexander D. Mair, Rte. 7, Box 143, Florence, Ala. 35630

Filed Mar. 11, 1985, Ser. No. 710,772

Int. Cl.[4] C01F *11/46*

U.S. Cl. 423—167

1 Sheets Drawing. 29 Pages Specification



Phosphate rock, containing appreciable quantities of organic impurities, is thermally treated under controlled conditions to fully utilize the fuel values of the organic matter contained therein. This process is beneficial for treating deposits of unaltered Idaho rock containing both higher grade phosphate rock and lower grade phosphatic shales and recovering therefrom substantially all the phosphate values as a rock product rendered more acceptable for acidulation to wet-process phosphoric acid.

REISSUES

JULY 1, 1986

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,195
SILVER HALIDE EMULSIONS CONTAINING AROMATIC LATENT IMAGE STABILIZING COMPOUNDS

Arthur H. Herz, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

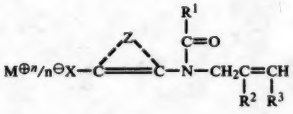
Original No. 4,423,140, dated Dec. 27, 1983, Ser. No. 392,043, Apr. 4, 1985. Application for reissue Apr. 4, 1985, Ser. No. 719,840

The portion of the term of this patent subsequent to Feb. 15, 2000, has been disclaimed.

Int. Cl.[4] G03C *1/34*

U.S. Cl. 430—445 **17 Claims**

1. A photographic silver halide emulsion containing a latent image stabilizing amount of a compound represented by the formula:



wherein:

R^1 is hydrogen, alkyl, or aryl;

R^2 and R^3 are each individually hydrogen, alkyl, alkoxy, carboxy, alkoxycarbonyl, or aminocarbonyl;

X is a middle chalcogen *chosen from the class consisting of sulfur and selenium*;

Z represents the atoms completing an aryl aromatic nucleus;

n is an integer of 1 or 2; and

$M^{\oplus n}$ is a cation of valence n chosen from the group consisting of an onium ion, an ion from group IA or IIA, and a metal ion from Group IIB, VIIB, IVA, or VA.

Re. 32,196
AURONE DERIVATIVES

Stephen R. Baker, Eversley; William B. Jamieson, Woking, and William J. Ross, Lightwater, all of England, assignors to Lilly Industries Limited, London, England

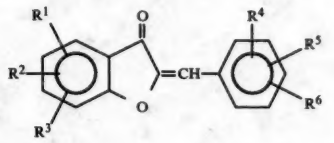
Original No. 4,259,340, dated Mar. 31, 1981, Ser. No. 71,515, Aug. 31, 1979. Application for reissue May 19, 1982, Ser. No. 379,793

Claims priority, application United Kingdom, Sep. 13, 1978, 36705/78

Int. Cl.[4] C07D *307/83, 405/02*

U.S. Cl. 514—382 **16 Claims**

20. A compound of the formula



in which R^1, R^2, R^3, R^5 and R^6 are the same or different and can each represent hydrogen, carboxyl, tetrazol-5-yl, —CH=CH-COOH, halogen, C_{1-6}alkyl, C_{1-6}alkoxy, C_{3-8}cycloalkyl, optionally substituted phenyl, C_{1-6}haloalkyl, amido, amino, cyano, hydroxy, nitro or C_{2-4}alkenyl and R^4 is carboxyl, tetrazol-5-yl or —CH=CHCOOH; or in which R^1 and R^2 taken together represent a group of the formula —CH=CH—CH=CH—; or a pharmaceutically-acceptable salt or ester thereof.

PLANT PATENTS

GRANTED JULY 1, 1986

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,756

ROSE PLANT NAMED BUCBLU

Griffith J. Buck, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Nov. 19, 1984, Ser. No. 672,697
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—11 **1 Claim**

1. A new and distinct variety of rose plant substantially as herein shown and described, characterized by its profuse production of large flowers of violet-blue color, its precocious development of lateral buds, its ability to survive without protection under adverse winter conditions, and the stability of the coloration of its blooms.

5,757

GERANIUM PLANT NAMED ORANGEADE

Griffith J. Buck, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Aug. 16, 1984, Ser. No. 641,266
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct geranium cultivar substantially as herein shown and described, characterized by its abundant production of large umbel-form clusters of very large florets, the red-orange coloring of its flowers, and its resistance to foliar diseases, particularly *Botrytis cinerea.*

5,758

GERANIUM PLANT NAMED TROUBADOUR

Griffith J. Buck, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Nov. 19, 1984, Ser. No. 673,103
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct geranium variety substantially as herein shown and described, characterized by its abundant production of umbel-formed clusters of very large florets, the strong red coloring of its flowers, and its resistance to foliar diseases, particularly *Botrytis cinerea.*

5,759

GERANIUM PLANT NAMED LA SEVILLANA

Griffith J. Buck, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Nov. 19, 1984, Ser. No. 673,104
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct geranium variety substantially as herein shown and described, characterized by its abundant production of umbel-formed clusters of large florets, the uniform red coloring of its flowers, its tolerance of high day and night temperatures and humidity, and its ability to grow vigorously and flower profusely under those climatic conditions.

PATENTS

GRANTED JUL. 1, 1986

ERRATA

For CLASS	See PATENT NO.
181–114	4,597,464
297–018	4,597,604
297–219	4,597,605
297–422	4,597,606
297–468	4,597,607
062–026	4,597,788
530–383	4,597,899
530–307	4,597,900
530–328	4,597,901
560–347	4,597,909
560–359	4,597,910
558–029	4,597,911
558–403	4,597,912
558–436	4,597,913
424–150	4,597,975
424–081	4,598,006

PATENTS

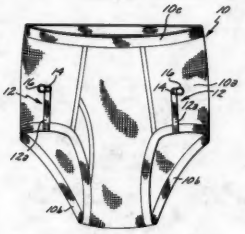
GRANTED JULY 1, 1986

GENERAL AND MECHANICAL

4,597,108
POWDERFREE SURGICAL GLOVES
Akira Momose, 1-100 Umeda, Kiryu, Guna, Japan (376-06)
Filed Nov. 28, 1984, Ser. No. 675,896
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—168 **5 Claims**

1. A method of producing natural rubber surgical gloves comprising the steps of halogenating both the outside surface and the inside surface of the gloves for different time periods.

4,597,109
GARMENT
Saburo Hironaga, 2910 W. Lingan La., Santa Ana, Calif. 92704
Filed Sep. 12, 1983, Ser. No. 531,393
Int. Cl.[4] A41F *19/00;* **A41B** *1/00*
U.S. Cl. 2—304 **8 Claims**

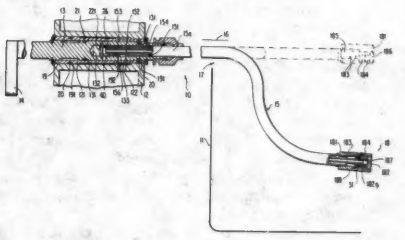


1. A garment comprising in combination,
means adapted to be worn by a human being and formed with a trunk portion and a pair of leg openings,
one or more extensions formed of elastomeric material and individually fixed to said trunk portion to extend upwardly of said trunk portion,
a button on each of said extensions,
and a clip for each button separate and unattached to said garment, garment extensions or buttons when not in use but adapted to engage the button when the respective button is at least partially encircled by fabric material from another garment worn by said human being above said trunk portion.

4,597,110
UNDERGARMENT
James R. Smith, Sr., and Martha J. Smith, both of Memphis, Tenn., assignors to Joe W. Johnson, Fulton, Ky.
Filed Nov. 19, 1984, Ser. No. 672,997
Int. Cl.[4] A41B *9/04*
U.S. Cl. 2—408 **3 Claims**

1. An undergarment comprising:
(a) a waistband connected to a body segment having front and back panels permanently connected to one another which terminate at leg openings;
(b) a crotch segment located between said leg openings;
(c) a crotch opening situated between said leg openings and separating said crotch segment and front panel along an edge of each extending generally parallel to said waistband and being located some distance above the narrowest portion of said crotch segment that extends between said leg openings;
(d) first fastener means provided on said front panel adjacent to said crotch opening;
(e) second fastener means provided on said crotch segment adjacent to said crotch opening and being releasably engageable with said first fastener means so that said crotch opening can be selectively opened and closed by selectively peeling apart and pressing together said first and second fastener means, and
(f) said edge of said crotch segment extending across a portion of said crotch segment that is wider than and located some distance above the narrowest portion of said crotch segment that extends between said leg portions.

4,597,111
SANITARY DEVICE
Yuji Hirashiba; Shinji Kawai, both of Toyota, and Tomio Oguma, Anjo, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan
Filed May 15, 1985, Ser. No. 734,221
Claims priority, application Japan, May 15, 1984,
Int. Cl.[4] E03D *9/08;* **A47K** *3/20*
U.S. Cl. 4—420.4 **1 Claim**



1. A sanitary device comprising tank means adapted to contain a supply of fluid and adapted to be located adjacent a toilet bowl, valve means rotatably supported on said tank means in fluid communication with said tank means, nozzle means secured to said valve means for rotation therewith and adapted to extend into said toilet bowl, said nozzle means comprising an inner pipe and an outer pipe disposed in concentric spaced apart relation and having means defining a first fluid passage between said pipes and a second fluid passage within said inner pipe, fluid passage means formed in said tank and first and second aperture means formed in said valve means whereby upon rotation of said valve means to a first position said first fluid passage will be disposed in fluid communication with said tank means through said fluid passage means and said first aperture means and upon rotation of said valve means to a second operating position said second fluid passage will be disposed in fluid communication with said tank means through said fluid passage means and said second aperture means and spray head means secured to the end of said nozzle means adapted to be located in said toilet bowl and having first fluid ejection hole means disposed in fluid communication with said first fluid passage and second fluid ejection hole means disposed in fluid communication with said second fluid passage for selectively spraying fluid on different portions of a person seated on said toilet bowl, said spray head means

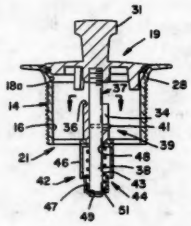
includes a substantially cylindrical main body having an axially extending stepped bore therein with the smaller diameter portion of said stepped bore being secured to said outer pipe, plug means threaded into the larger diameter portion of said stepped bore and having an apertured annular boss extending axially inwardly toward said smaller diameter portion, sealing means disposed intermediate said larger and smaller diameter portions of said bore in contact with said annular boss with said inner pipe extending through said sealing means into said annular boss whereby said first fluid passage and said first hole means will be separated from said second fluid passage and said second hole means in a fluid tight manner.

4,597,112

SPRING SEALED DRAIN FITTING

Casper Cuschera, 1047-77th Ave., Oakland, Calif. 94621

Filed May 8, 1985, Ser. No. 731,943
Int. Cl.⁴ A47K 1/14
U.S. Cl. 4—287 **6 Claims**



1. In a drain fitting having an annular body adapted to be fitted into a drain opening and which defines a drain flow passage therethrough, a flow transmissive spider member attached to said body and extending across said drain flow passage, a closure member movable towards said spider and away therefrom between a closed position at which flow is blocked from said drain passage and an open position at which flow may enter said drain passage, the improvement comprising:

spring means for resiliently urging said closure member towards said closed position thereof,

latching means for selectively holding said closure member at said open position thereof in opposition to the force of said spring means,

guide means secured to said spider member and having a guide passage which is coaxial with said drain passage, a stem extending from said closure member through said guide passage and having an end closure member, wherein said spring means includes a helical compression spring disposd coaxially on said end portion of said stem and being positioned to urge said end portion of said stem outwardly from said opposite side of said spider member, said spring means being proportioned to remain in a state of partial compression when said closure member is at said closed position thereof.

4,597,113

INFLATABLE RESERVOIR FOR CONTAINING A LIQUID, MORE ESPECIALLY AN INFLATABLE SWIMMING POOL, AND A METHOD FOR FILLING SAME

Michel Eymard, Toulouse, France, assignor to Zodiac, Issy les Moulineaux, France

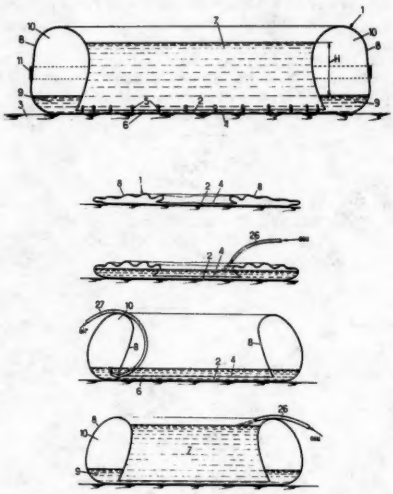
Filed Mar. 21, 1985, Ser. No. 714,247
Int. Cl.⁴ E04H 3/18
U.S. Cl. 4—488 **6 Claims**

1. An inflatable reservoir for containing a liquid, more especially an inflatable swimming pool, made of a single sheet of a flexible and fluid tight material defining:

a central zone forming the bottom supporting thereover the liquid filling the reservoir, and

a peripheral space formed by the rest of the sheet folded back on itself inwardly along the whole of its periphery so as to form approximately a peripheral tube, filled partially with liquid coming from the liquid filling the reservoir and partially with gas coming from a gas filling:

said reservoir being furthermore provided with discontinuous



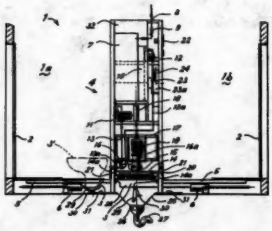
mechanical connection means for connecting the free edge of the folded down remainder of the sheet to the central zone, at least one passage being provided between the central zone and the peripheral space so that the liquid filling the central zone flows into the peripheral space.

4,597,114

SANITARY FACILITY WITH MEANS FOR AUTOMATIC CLEANING

Romualdo Paterlini, San Ilario d'Enza, Italy, assignor to Coopsette S.C.R.L., Castelnovo di Sotto, Italy

Filed Jan. 17, 1985, Ser. No. 692,659
Claims priority, application Italy, Jan. 20, 1984, 19265 A/84
Int. Cl.⁴ E03D 9/00
U.S. Cl. 4—662 **11 Claims**



1. An automatic sanitary facility comprising:

a plurality of toilet compartments;

a service column adjacent said toilet compartments;

a toilet bowl for each compartment shiftable into said service column and back from said service column into the respective compartment; and

automatic means in said service column for controlling the transfer of each of said bowls from each of said compart-

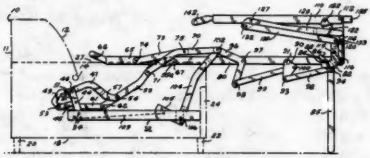
ments in turn into and out of said service column and for hydraulically and mechanically scrubbing said bowls within said column, said service column comprising a brush with flexible bristles actuated by a motorized reducer and supported by a frame, movable by means of an actuator between a raised rest position and a lowered working position.

4,597,115

LOW SEATING LEVEL SOFA-BED MECHANISM

Louis Pokorny, Jr., Ronkonkoma, and L. Robert Pokorny, Wading River, both of N.Y., assignors to Louis Pokorny Company, Inc., Ronkonkoma, N.Y.

Filed Feb. 4, 1983, Ser. No. 463,842
Int. Cl.[4] A47C *17/14*
U.S. Cl. 5—13 **5 Claims**



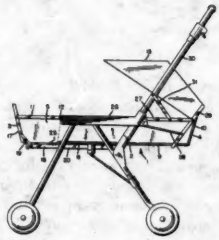
1. In a sofa-bed mechanism having a relatively stationary bracket and in which bed sections are pivoted to one another in succession and include a rear section and a lower horizontal section, and a linkage system causes the sections to move a predetermined path between a folded condition and an extended condition: the linkage system including a main control link pivotally connected to said rear and lower horizontal sections, a first subsidiary control link pivoted to the main control link, a second subsidiary control link pivoted to the bracket and to the main control link, and a pivot link pivotally mounted on the bracket and defining the pivot axis for the first subsidiary control link, the pivot link moving to shift the pivot axis of the first subsidiary control link as the bed sections move from their folded condition to their extended condition.

4,597,116

BED FOR BABY CARRIAGES

Kenzou Kassai, Osaka, Japan, assignor to Kassai Kabushikikaisha, Osaka, Japan

Filed Feb. 9, 1984, Ser. No. 578,671
Claims priority, application Japan, Feb. 14, 1983, 58-23373
Int. Cl.[4] A47D *9/00, 13/02*
U.S. Cl. 5—99 A **3 Claims**



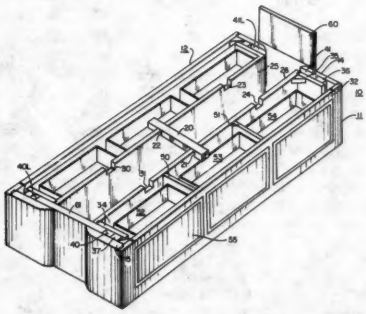
1. A bed for baby carriages which is in the form of a unitary box having a bottom wall, a front wall, a back wall, a left-hand side wall, and a right-hand side wall, comprising a pair of upper side frames for suspending front portions of said left-hand and right-hand side walls, said side frames extending along upper sides of said front portions of the left-hand and right-hand side walls and are turnably supportable at their rear ends by transverse shafts connectable to a baby carriage, wherein, the front portions of the left-hand and right-hand side walls suspended by said upper side frames are made of a flexible material, a folding line is formed along the boundary line between the front and rear portions of the bottom wall, the downward turning of said upper side frames causes the front wall to be displaced downwardly, so that while the front portions of said left-hand and right-hand side walls are bent, the front portion of the bottom wall is folded rearwardly along said folding line, whereby the front is opened to enable the bed to be used as a chair, said bed further comprising support means also connectable to a baby carriage for retaining the horizontal position of said upper side frames, wherein said support means for retaining the horizontal position of said upper side frames comprises a pair of front links, first pivot means for turnably connecting said front links to front ends of the upper side frames, said front links extending along the front sides of the left-hand and right-hand side frames, a pair of draw links longitudinally slidably secured to opposite sides of said bottom wall, a pair of connecting links, second pivot means turnably securing one end of said pair of connecting links to said front ends of said draw links, third pivot means securing the other end of said pair of connecting links to said front links, whereby said connecting links are pivoted between said front links and said draw links, said bottom wall having a flexible front portion connected to said front wall, flexible support means arranged below said flexible front portion of said bottom wall and connected to the front end of said draw links for supporting said flexible front portion when said draw links are in the most forward position, said flexible support means folding out of the way when said draw links are in the rearmost position so that said flexible front portion of said bottom wall forms a slack.

4,597,117

ADJUSTABLE BASE SUPPORT APPARATUS FOR A WATERBED OR A SIMILAR ARTICLE

Samuel Sumner, Amsterdam, N.Y., assignor to First Amsterdam Corp., New York, N.Y.

Filed Jan. 7, 1985, Ser. No. 689,298
Int. Cl.[4] A47C *19/04, 19/22*
U.S. Cl. 5—181 **20 Claims**



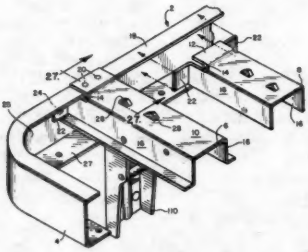
1. A base support apparatus for a waterbed or similar article comprising:

right and left units each of a rectangular configuration having a front wall and a back wall with said back wall having coupling means spaced along the top surface thereof, and said back wall having extending front and rear side sections which extend towards said front wall, said front wall having corresponding extending front and rear side sections which extend towards said back wall with said extending front and rear side sections of said front and back

walls forming a space therebetween and means for coupling the corresponding extending sections of said front wall to a corresponding extending section of said back wall to form a defined space with the spaces of said right unit facing the spaces of said left unit at both said front and rear ends, with said left and right units coupled together by cross tie means directed between said back walls and coacting with said spaced coupling means to vary the distance between said left and right units according to the length of said cross ties, and first and second slideable panels inserted in said spaces at said front and rear ends to close said ends independent of the length of said cross tie means.

4,597,118
COMBINED BED FRAME AND BOX SPRING ASSEMBLY

Frank J. Mis, 9601 S. Robertson, Oak Lawn, Ill. 60453
Filed May 31, 1984, Ser. No. 615,567
Int. Cl.[4] A47C *23/04, 19/00*
U.S. Cl. 5—246 **8 Claims**



1. A combined bed spring and frame assembly comprising a metal frame having end and side beams integrated into a generally quadrilateral structure having a generally horizontal top wall,

a plurality of transverse bed-spring mounting and supporting beam members extending between said side beams and connected at their ends thereto,

a pair of transverse leg support beam members extending between and connected at opposite ends to said side beams,

each of said transverse beam members having vertical side wall means and a top web with an end portion comprising an upwardly offset tab,

said side wall means having upper edges spaced vertically below said tab and defining a horizontal slot therewith snugly admitting a portion of the top wall of the adjacent side beam therein between said upper edges and said tab,

and means weld-connecting the tab to said portion of the adjacent side beam.

4,597,119
SUNTANNING DEVICE

Edwin Padgett, P.O. Box 400, Lady Lake, Fla. 32659
Filed Dec. 17, 1984, Ser. No. 682,253
Int. Cl.[4] A47C *20/00*; A61G *7/00*; A61H *33/00*
U.S. Cl. 5—431 **2 Claims**

1. A rotatably adjustable reclining chair comprising:

a base;

a support plate above said base;

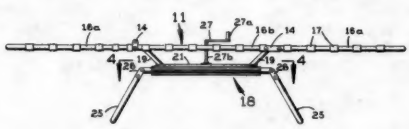
coupling means at the center of said support plate acting between said base and said support plate to permit rotation of said support plate horizontally above said base;

anti-friction bearings acting between said base and said support plate at a substantial distance laterally outward from said coupling means;

an electric motor mounted on said base;

a pinion operatively coupled to said motor to be driven thereby, said pinion being offset a substantial distance laterally outward from said coupling means and being rotatable about a vertical axis;

said support plate having means thereon providing a series of teeth in succession circularly about the rotational axis of the support plate at a substantial distance laterally outward from said coupling means, said teeth meshing in



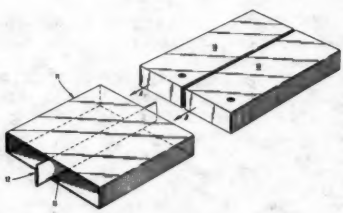
succession with said pinion as said support plate is rotated by the pinion;

a reclining chair frame with opposite side rails, each having a middle piece spaced above said support plate and opposite end pieces pivoted respectively to said middle piece for adjustment to selected angular positions with respect to said middle piece;

and rigid braces extending up from said support plate to said middle pieces of the chair frame side rails to support the chair frame for rotation in unison with said support plate.

4,597,120
WATERBED UTILIZING DUAL FLUID-FILLED MATTRESSES AND HAVING IMPROVED SURFACE CONTINUITY

Isaac Fogel, Silver Spring, and Donald W. Keefer, Pasadena, both of Md., assignors to Classic Corporation, Jessup, Md.
Continuation of Ser. No. 500,823, Jun. 3, 1983, abandoned. This application Mar. 21, 1985, Ser. No. 714,069
Int. Cl.[4] A47C *27/08*
U.S. Cl. 5—451 **14 Claims**



1. A waterbed comprising:

a pair of like fluid-filled mattresses arranged side-by-side;

surface continuity means at least partly transversely encircling said pair of mattresses for maintaining said mattresses steadfastly in side-by-side relationship and for reducing the collapse of the abutting edges of said mattresses under load, said surface continuity means having a top wall above said mattresses and a bottom wall below said mattresses; and

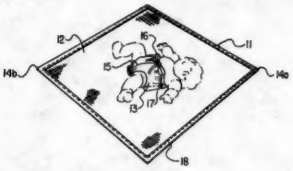
means attached to said surface continuity means for reducing motion transfer and heat transfer between said mattresses, wherein said transfer reducing means comprises a partition separating said pair of mattresses, said partition being attached only on one side to said bottom wall of said suface continuity means and being unattached and movable relative to said top wall of said surface continuity means.

4,597,121

INFANT COVER WITH RECEIVING POUCH

Juliette A. Bouma, P.O. Box 282, Augus.a, Mont. 59410

Filed Apr. 13, 1984, Ser. No. 600,010
Int. Cl.[4] A47G *9/00*
U.S. Cl. 5—494 **8 Claims**



1. A cover for enveloping an infant or small child, said cover having a fabric section attached to a central portion thereof, said fabric section comprising:

an upper edge, first and second oppositely positioned side edges extending substantially orthogonally with respect to said upper edge and first and second curved lower edges extending downwardly from respective first and second side edges and converging to form a third lower edge at a lowermost portion of said fabric section, said third lower edge being substantially parallel with said upper edge;

said fabric section being attached to said cover along substantially the entire respective lengths of said first and second side edges and along substantially the entire width of said third bottom edge, the attachment of said fabric section to said cover defining a pouch member for receiving the legs and lower torso of a child;

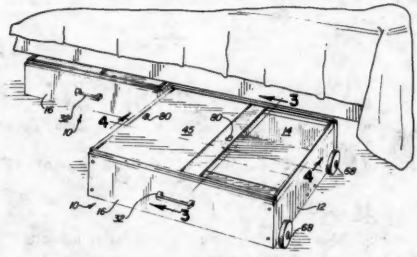
said upper edge further including a casing member attached along substantially the entire length thereof, said casing member having a drawstring partially disposed therein, and a plurality of pleat members disposed adjacent to said third lower edge to prevent the material of the fabric section from bunching up around the child's crotch when the child is placed in the pouch member.

4,597,122

FREE-STANDING DRAWER

Milton E. Handler, Northbrook; Richard Sylvan, Glenview, and Herbert Baisch, Palatine, all of Ill., assignors to Hirsh Company, Skokie, Ill.

Filed Jun. 10, 1985, Ser. No. 741,750
Int. Cl.[4] A47C *21/00*; A47B *88/14*
U.S. Cl. 5—503 **6 Claims**



1. A free-standing drawer adapted for operational positioning under a bed or the like comprising:

a pair of side walls, a back wall, and a front wall;

a multi-panel bottom wall supported between said side, back, and front walls;

support means interconnecting said bottom wall panels;

door means mounted on said side, back, and front walls closing the top of said drawer and movable to provide access to the interior thereof, said door means including a pair of sliding door panels and further including jamb means and track means mounted on said drawer walls for operationally guiding said door panels therein, said track means including a pair of elongated integral track members each having a pair of legs defining a channel, said track legs being normally angled toward each other, the track legs of one of said track members being snap-fittingly mounted on the top of said back wall and the track legs of the other of said track members being snap-fittingly mounted on the top of said front wall; and

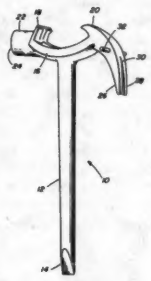
roller means supporting said drawer whereby said drawer may be readily rolled out from, and back under, said bed or the like.

4,597,123

COMBINATION FIREFIGHTER'S TOOL

Walter T. Cobe, Jr., 154 Dwelley Ave., Hanover, Mass. 02339

Filed Jun. 10, 1985, Ser. No. 742,976
Int. Cl.[4] B25F *1/00*; B25B *13/48*
U.S. Cl. 7—138 **4 Claims**



1. Firefighter combination tool comprising:

an elongate handle member having first and second ends, the first end tapering into a wedge shape;

an arcuate spanner wrench portion affixed to the second end of the handle and including inwardly angled projections extending from opposite ends of the arcuate portion;

a substantially cylindrical member depending from one of the ends of the arcuate portion and having a flat face parallel to the elongate handle member;

first and second claw members depending from the other end of the arcuate member, the first and second claw members diverging from a narrow separation proximal to the arcuate member, the claw members extending in a plane formed by the elongate handle and the arcuate member and diverging in a plane perpendicular to the plane formed by the elongate handle and the arcuate member; and

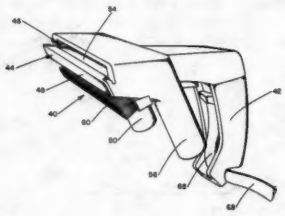
a pin member extending beyond the claw members in a direction perpendicular to the plane formed by the elongate handle and the arcuate member and located between the narrow separation of the claw members and the arcuate member.

4,597,124

METHOD AND APPARATUS FOR CLEANING UPHOLSTERY

Robert C. Williams, III, 11309 Derby Dr., Raleigh, N.C. 27612, and N. Bruce Unruh, 1105 Radley Dr., West Chester, Pa. 19380

Filed Dec. 26, 1984, Ser. No. 686,419
Int. Cl.[4] D06M *1/00*
U.S. Cl. 8—158 **14 Claims**



1. An upholstery cleaning system comprising:

A. a hand-held upholstery cleaning applicator including:

a handle frame for graspig and controlling said hand-held applicator;

a jet secured to said handle frame for directing a cleaning solution onto the upholstery;

a hand actuated control valve associated with said jet for controlling the flow of cleaning solution to the same;

an elongated brush mounted on said applicator adjacent said jet for engaging the upholstery and agitating the same after the cleaning solution has been applied by said jet;

a vacuum head formed in said applicator adjacent said brush for lifting cleaning solution and associated dirt and debris from the upholstery, said vacuum head including means defining an elongated vacuum inlet adjacent said brush, a vacuum outlet and a vacuum chamber communicatively interconnecting said vacuum inlet and said vacuum outlet;

a dry air manifold formed in said applicator adjacent said vacuum head for directing heated air onto said upholstery after the cleaning solution is removed therefrom, said dry air manifold including a dry air outlet disposed adjacent said vacuum inlet, a dry air inlet and a dry air chamber communicatively interconnecting said dry air inlet and said dry air outlet;

said vacuum head and said dry air manifold being integrally formed and interconnected with said handle frame;

B. a remote support unit including:

a housing structure having a supply tank for holding cleaning solution prior to directing the same onto the upholstery and a recovery tank for receiving said cleaning solution after the same is removed from the upholstery;

a pump means interconnected within said support unit and associated with said supply tank for directing the cleaning solution from the supply tank to a means defining an outlet;

a blower having an exhaust disposed within said support unit and associated with said recovery tank for moving air from an initial position into said recovery tank and then directing the air out said exhaust;

a heating unit operatively connected with said exhaust of said blower for heating the air directed from said exhaust; and

C. connecting means for interconnecting said upholstery applicator and said support unit, said connecting means including:

a solution supply line communicatively interconnected between said outlet and said control valve for carrying said cleaning solution from said outlet to said control valve;

a vacuum hose communicatively interconnected between said recovery tank and said vacuum outlet on said hand-held applicator wherein said vacuum hose effectively interconnects said blower and said vacuum inlet such that said blower induces air into said vacuum inlet effectively picking up a combined mixture of air and cleaning solution and any dirt and soil associated therewith wherein said combined mixture is directed into said recovery tank where said air and cleaning solution are separated; and

a blower hose communicatively interconnected between said heating unit and said dry air inlet on said hand-held applicator wherein said blower hose effectively interconnects said exhaust of said blower and said dry air outlet such that said blower directs air from said recovery tank to said dry air outlet where said air is directed onto said upholstery for drying the same, wherein said air is heated as the same passes through said heating unit towards said dry air outlet.

14. A safe and reasonably effective method of cleaning upholstery using a hand-held applicator and a remote cleaning unit comprising the steps of:

A. directing a cleaning solution from a supply tank on said remote unit to a cut-off valve on said hand-held applicator;

B actuating said cut-off valve and directing the cleaning solution to a jet secured to said hand-held applicator;

C. spraying the cleaning solution through said jet onto said upholstery while making a swath across the upholstery with the hand-held applicator;

D. engaging a brush secured to said hand-held applicator with said upholstery immediately after said cleaning solution is sprayed onto the same;

E brushing the cleaning solution into the upholstery while continuing to move the applicator across the upholstery with the hand-held applicator;

F. passing a vacuum head secured to said hand-held applicator over said upholstery immediately after brushing the same;

G. removing the cleaning solution from the upholstery by inducing air into said vacuum head and effectively picking up a combined mixture of air and cleaning solution while continuing to move the applicator across the upholstery;

H. directing the mixture of air and cleaning solution from the vacuum head to a recovery tank carried by said remote unit;

I. separating the mixture of air and cleaning solution and containerizing the separated cleaning solution in said recovery tank;

J. directing the air from the recovery tank to a drying outlet secured to said hand-held applicator;

K. heating the air between said recovery tank and said drying outlet;

L. passing said drying outlet over the upholstery immediately after removing the cleaning solution from the same;

M. drying the upholstery by directing the heated air from said drying outlet onto the upholstery while continuing to make a swath across the upholstery with the hand-held applicator; and

N. repeating the above steps until a selected area of the upholstery has been cleaned.

4,597,125

METHOD OF STIFFENING AN INSOLE DURING THE CEMENT LASTING OF FOOTWEAR

Paul Jones, Jr., Falmouth, Me., assignor to Wingspread Corporation, New York, N.Y.

Division of Ser. No. 383,670, Jun. 1, 1982, Pat. No. 4,519,147. This application May 9, 1985, Ser. No. 732,469
Int. Cl.[4] A43D *9/00*
U.S. Cl. 12—142 F **7 Claims**

1. A method of manufacturing a cemented construction of footwear comprising the steps of:

providing an insole composed of a thin, soft and compliant material of insufficient stiffness to withstand a lasting operation;

temporarily bonding said insole by means of a softenable wax to a substantially stiff supporting member of sufficient stiffness to withstand a lasting operation;

securing said bonded insole and supporting member to a last,

said supporting member being positioned adjacent said last;

applying an upper member to said last;

securing said upper member to said insole thereby forming a complete upper;

providing an outsole having a cushion therein of generally the same configuration as at least part of said insole;

cementing said completed upper to said outsole such that said insole overlies said cushion;

removing said last from the thus formed footwear;

removing said substantially stiff supporting member; and,

burnishing any residual traces of said softenable wax on the then exposed face of said insole into the body of said insole.

4,597,126

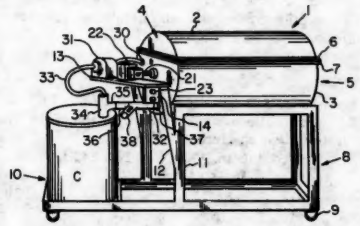
MACHINE FOR CLEANING A PLURALITY OF FLOOR MAINTENANCE PADS

Robert A. Beech, 310 Thompson Run Rd., Pittsburgh, Pa. 15237

Filed May 13, 1985, Ser. No. 732,925

Int. Cl.[4] A47L *25/00*

U.S. Cl. 15—3 **10 Claims**



1. A machine for cleaning a plurality of floor maintenance pads comprising:

a top-loading operating tank;

a removable drive axle, horizontally and rotatably mounted within said tank, upon which a plurality of floor pads can be loaded;

means for rotating said drive axle from outside said tank;

means for filling said tank from a container of cleaning solvent; and

means for agitating the floor pads with said tank, said agitating means including:

an agitator bar frame mounted to the interior of said tank such that the cleaning machine may be operated either with said frame raised or lowered over the floor pads on said drive axle; and

a plurality of uniformly-spaced agitator bars, mounted to said frame, for contacting simultaneously with both sides of the floor pads placed therebetween.

4,597,127

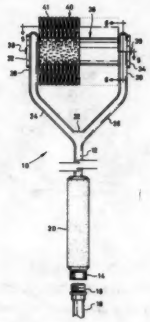
HYDRAULIC CAR WASH BRUSH

Robert A. Swanson, Rte. 9, Box 9, McMinnville, Tenn. 37110

Filed Dec. 24, 1984, Ser. No. 685,347

Int. Cl.[4] A46B *13/06*

U.S. Cl. 15—24 **14 Claims**



1. A hydraulically driven rotary brush assembly for washing the surface of vehicles and the like with water, which comprises:

a wand element having a coupling unit at a first end for releasable connection to a source of pressurized water, said wand element having a further end terminating in a Y-connection having two legs, each leg having a first end joined to said further end of said wand and a further end, said wand and at least one of said legs having passageways communicating with said first end of said wand, said leg having said passageway terminating at said further end in a turbine housing;

an elongated hollow cylindrical drum, having a substantially uniform cross section and a central axis, rotatably and releasably mounted between said further ends of said legs for rotation about said drum axis, said legs having sufficient flexibility to permit spreading said further ends thereof to remove said drum;

a cylindrical brush unit surrounding said drum for rotation with said drum, said brush unit having a plurality of brush elements projecting substantially radially from said drum axis during rotation of said drum;

a plurality of substantially flat turbine blades circumferentially spaced about, and adjacent to, an end of said drum mounted in said leg having said passageway, each of said turbine blades extending substantially radially from said drum and positioned to be aligned with said passageway in said leg, with said turbine housing partially enclosing said turbine blades;

whereby water flowing through said wand and said leg having said passageway impinges upon said turbine blades aligned therewith causing concomitant rotation of said drum and said brush unit, with said water being discharged from said turbine housing upon such vehicle during such washing thereof.

4,597,128

FLEXIBLE VEHICLE WASHING BRUSH AND COUPLING THEREFOR

James W. Roncaglione, 9807 Bridleridge Ct., Vienna, Va. 22180

Filed May 10, 1983, Ser. No. 493,344

The portion of the term of this patent subsequent to Apr. 16, 2002, has been disclaimed.

Int. Cl.[4] B60S *3/06*

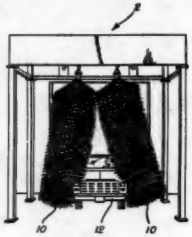
U.S. Cl. 15—53 AB **8 Claims**

1. A vehicle washing apparatus, comprising:

overhead support means located above or adjacent to the path of a vehicle to be washed;

an elongate vertically disposed flexible and rotatable washing member having a free lower end and being supported at the upper end thereof by said support means, said washing member comprising a flexible elongate cable, a plurality of washing material support members secured to said cable, and washing materials supported by said support members; and

rotating means for imparting rotary motion to the upper end of said rotatable washing member.



4,597,129

WINDSCREEN WIPER DEVICE

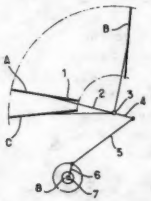
Jean-Pierre H. Eustache, Antony, and Daniel L. Maubray, Issy-les-Moulineaux, both of France, assignors to Equipements Automobiles Marshall, Issy-les-Moulineaux, France

Filed Dec. 21, 1984, Ser. No. 684,713

Claims priority, application France, Dec. 26, 1983, 83 20768

Int. Cl.[4] B60S *1/22, 1/24*

U.S. Cl. 15—250.16 **15 Claims**



15. A windscreen wiper device comprising: a drive motor; a drive crank mounted fast on a drive shaft of said drive motor; a connecting rod pivotally mounted on said drive crank by means of crank pin means and a windscreen wiper blade support connected to said connecting rod so that rotation of said drive crank by said drive motor rotating in a first direction sweeps said support arm through a predetermined arc, wherein there are provided means mounted on and rotatable with the drive means for displacing said crank pin means between a first position, which is proximal of said drive shaft, to a second position, distal of said drive shaft, and means for locking said crank pin means in said first or second position, said displacing means releasing said locking means and displacing said crank pin means from said first and said second position whereat it is locked by said locking means when said motor rotates in a direction opposite to said first direction, and releasing said locking means and displacing said crank pin means from said second position to said first position whereat it is locked by said locking means when said motor rotates in said first direction.

4,597,130

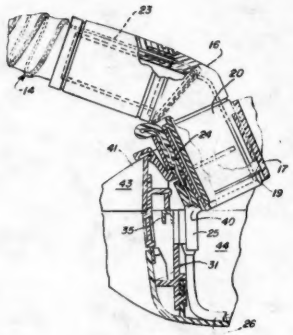
ELECTRICAL CONNECTION MEANS FOR CANISTER VACUUM CLEANER

John B. Lyman, Bloomington, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 9, 1985, Ser. No. 690,304

Int. Cl.[4] A47L *9/28*

U.S. Cl. 15—327 R **20 Claims**



1. In a vacuum cleaner having a canister including a base defining a suction space and a cover removably closing said space, a suction hose having an end defining a suction connector, means formed on said cover defining a suction inlet opening for receiving the hose end connector to conduct dirt laden air to said space, and electrical conductor means carried by the suction hose and having a first electrical connector associated with said suction connector, the improvement comprising:

a second electrical connector complementary to said first electrical connector mounted to said base to have electrical connected association with said first electrical connector as an incident of said suction connector being installed in said inlet opening, said cover being substantially free of forces developed in effecting electrical connection and disconnection of said first electrical connector relative to said second electrical connector.

4,597,131

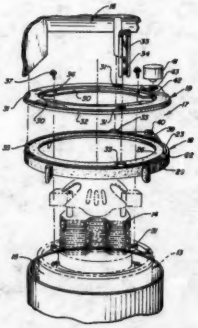
MOUNTING FOR MOTOR-FAN UNIT

John B. Lyman, Bloomington, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jul. 16, 1984, Ser. No. 632,124

Int. Cl.[4] A47L *9/22*

U.S. Cl. 15—412 **30 Claims**



1. In a vacuum cleaner having a housing, and a motor and

suction fan unit in said housing, improved means for mounting the motor and fan unit to the housing comprising:

resilient support means carried by the housing; and

rigid support means mounted to the motor and fan unit and resting on said resilient support means, said support means cooperatively defining combined support means for mounting the motor and fan unit resiliently to the housing for controlled free movement relative to the housing and effectively free of transmission of vibrations from the motor and fan unit to the housing in the operation of the vacuum cleaner, said combined support means comprising means for causing the resilient support means thereof to be subjected substantially to only compressive stress in supporting the motor and suction fan unit.

4,597,132

BAND SAW FOR CUTTING CARCASSES OR THE LIKE

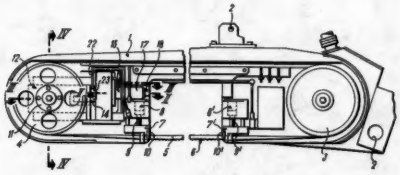
Stefan Elmer, Oetisheim, and Erich Forberger, Maulbronn, both of Fed. Rep. of Germany, assignors to Schmid & Wezel, Maulbronn, Fed. Rep. of Germany

Filed May 24, 1984, Ser. No. 613,960

Claims priority, application Fed. Rep. of Germany, May 30, 1983, 3319623

Int. Cl.[4] A22B *5/20*; B27B *13/10*

U.S. Cl. 17—23 **30 Claims**



1. A band saw, particularly for cutting carcasses, comprising a support; a plurality of pulleys carried by said support and rotatable about parallel axes; an endless flexible saw blade trained over said pulleys, at least one of said pulleys being movable relative to another of said pulleys so as to tension or relax the tensional stress upon said blade; and means for tensioning said blade, including first biasing means activatable to react against said support and to act upon said one pulley with a first force, and second biasing means activatable to react against said support and to act upon said one pulley with a second force greater than said first force.

4,597,133

DEVICE FOR TRANSFERRING SLAUGHTERED POULTRY

J. A. van de Nieuwelaar, Germert, Netherlands, assignor to Stork PMT B.V., Boxmeer, Netherlands

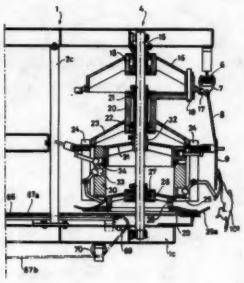
Filed Feb. 8, 1985, Ser. No. 699,953

Claims priority, application Netherlands, Feb. 10, 1984, 8400447

Int. Cl.[4] A22C *21/00*

U.S. Cl. 17—24 **10 Claims**

1. Device for transferring slaughtered poultry from a first conveyor track having first suspension hooks, engaging on the knee-stumps of the birds, to a second conveyor track, having second suspension hooks, also engaging on the knee-stumps of the birds, with an input station adjoining the first track, for introducing the birds into transfer units having reception members which protrude from a transfer track running between the first and second conveyor track and having an output station, adjoining the second track, for transferring the birds from the transfer units to the second hooks, the transfer units each being constructed with two reception slots, located next to one another, for receiving the upper legs of the birds, in which the input station is provided with a plurality of overhanging units moving in a closed track, the movement of which is synchronised in such a way with the movement of the suspension hooks moving in front of it and the transfer units moving below it that the respective positions thereof alway coincide over a portion of the track thereof, and each overhanging unit is provided with an overhanging member, ifself provided with two reception slots, the member being caused to move to and



fro in such a manner about a horizontal axis in a vertical plane in front of the suspension hooks and transfer hooks that during the upward movement the legs of the birds are raised out of the suspension hooks by the reception slots and at the end of the subsequent downward movement are placed in the reception slots of a transfer unit.

4,597,134

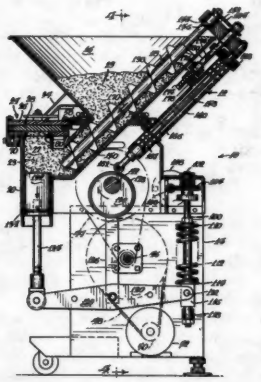
FEED MECHANISM FOR A PATTY MAKING MACHINE

Richard C. Wagner, c/o Hollymatic Corporation, 600 E. Plainfield Rd., Countryside, Ill. 60525

Filed Oct. 3, 1984, Ser. No. 657,254

Int. Cl.[4] A22C *7/00*

U.S. Cl. 17—32 **23 Claims**



21. In a patty making machine having a chamber into which the patty product is fed for forming into a patty, a product feed mechanism comprising:

a hopper adapted to receive a quantity of product, said hopper being conical with its inner wall at a slant about an axis;

an auger extending between the hopper and the chamber, said auger extending along said hopper wall and having its axis intersecting the hopper axis;

means for advancing the auger along its axis toward the chamber to feed product thereto; and

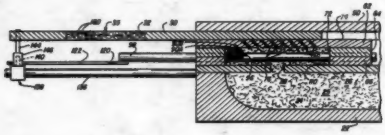
drive means for rotating the hopper and auger one relative to the other about the hopper axis.

4,597,135

FOOD PATTY FORMING METHOD AND APPARATUS EMPLOYING TWO OR MORE AGITATOR BARS

Harry H. Holly, and James A. Holly, both of Boca Raton, Fla., assignors to Holly Systems, Inc., Boca Raton, Fla.

Filed Feb. 21, 1984, Ser. No. 582,011
Int. Cl.[4] A22C 7/00
U.S. Cl. 17—45 16 Claims



14. A method for forming a patty of plastic food material containing tissue fibers, said method comprising the steps of:

(a) providing a foraminous member having an upstream side a downstream side with apertures in said foraminous member which communicate between said upstream side and said downstream side and which define an array of openings at said upstream side which are arranged in a first set of sapced-apart parallel rows and a second set of spaced-apart parallel rows wherin the rows of the first set are oriented at an acute angle relative to the rows of the second set;

(b) providing mold parts disposed adjacent said foraminous member with said mold parts having a mold cavity defining at least a portion of the exterior surface of said patty and having a mold opening to said mold cavity and relatively positioning said foraminous member and said mold parts to dispose said mold opening at a patty molding position adjacent said downstream side of said foraminous member;

(c) forcing said food material under pressure from the upstream side of foraminous member through said apertures to the downstream side of said foraminous member and into said mold opening and cavity as extrudate masses which together form said patty; and

(d) providing at least two agitator bars adjacent said upstream side of said foraminous member with one of said agitator bars having a plurality of spaced-apart teeth oriented with each tooth located between two adjacent rows of said first set of parallel rows of foraminous member openings and with the other of said agitator bars having a plurality of spaced-apart teeth oriented with each tooth between two adjacent rows of said second set of parallel rows of foraminous member openings, and then, before, during, or after step (c), reciprocating each said agitator bar along a path that is at an angle to the path reciprocation of the other agitator bar, the paths of travel of the teeth of said one agitator bar and the path of travel of the teeth of said other agitator bar defining parallelograms that each separately circumscribe one of the foraminous member aperture openings whereby the food material adjacent said upstream side of said foraminous member is agitated to dislodge tissue fibers that may have lodged on the upstream side of said foraminous member.

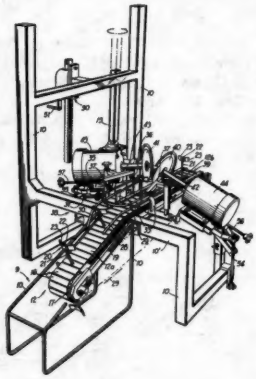
4,597,136

ON-LINE WING REMOVAL SYSTEM

Jacobus E. Hazenbroek, Burg de Zeeuwstratt 52, Numansdorp, Netherlands

Filed Jul. 2, 1984, Ser. No. 627,226
Claims priority, application Netherlands, Jan. 18, 1984, 8400163
Int. Cl.[4] A22C 21/00
U.S. Cl. 17—52 18 Claims

1. Apparatus for severing the wings from the carcasses of birds as the birds are conveyed suspended invertedly from shackles in a poultry processing line, and with said apparatus comprising, in combination, a conveyor mounted for movement along an endless path that includes movable upper and lower flights with the upper flight positioned below and extending approximately parallel to the processing line, a plurality of mutually spaced bird engaging push bars mounted at intervals to the flights of said conveyor so as to extend upwardly from the upper flight of said conveyor as the upper flight moves beneath the processing line, means for moving the upper flight of said conveyor in timed relationship with the movement of the shackles of the processing line so that the push bars each move with and in position behind a bird carried by a shackle so as to push the carcass of the bird along the processing line, a pair of vertically spaced guide bars mounted above said upper flight on one side of said upper flight and



another pair of vertically spaced guide bars mounted above said upper flight on the other side of said upper flight with said pairs of vertically spaced guide bars positioned to recieve, guide and apply friction to the wings of the birds moving along the upper flight, and a pair of rotary cutting blades mounted along opposite sides of said upper flight adjacent said pairs of guide bars, whereby as the birds are carried by the shackles of the processing line the guide bars receive, guide and apply friction to the wings of the birds and tend to tilt the birds away from the direction of movement of the upper flight and the push bars push against the carcasses of the birds to urge the birds in the direction of movement of the upper flight and control the tilt of the birds and the cutting blades cut between the wings and the carcasses of the birds.

4,597,137

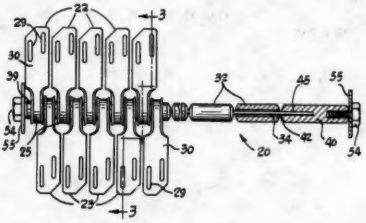
HINGE PIN AND HINGE PIN TOOL

J. Patrick Droppleman, Lincolnshire; Iner C. Olson, Lombard; Jeffrey S. Phillip, Wildwood, and Steven K. Berning, Evanston, all of Ill., assignors to Ocenco Incorporated, Northbrook, Ill.

Filed Sep. 12, 1984, Ser. No. 649,749
Int. Cl.[4] F16G 3/02
U.S. Cl. 24—33 P 7 Claims

1. A hinge pin construction for use in connecting the aligned hinge eyes of a first and second plurality of alternately arranged splice clips which first and second plurality of splice clips are respectively connected to opposed free ends of a belt or the like to make the belt continuous including in combination a plurality of hinge pin bushings arranged end to end and extending through the aligned hinge eyes of the first and second plurality of splice clips, each of said hinge pin bushings having a bore extending therethrough and having a given length, first and second hinge pin termination bushings located at opposite ends of said arranged hinge pin bushings, a flexible cable having first and second end portions and extending through said bores in said arranged hinge pin bushings, said

cable having a smaller diameter than said bores and being unattached to said hinge pin bushings to permit rotation of said hinge pin bushings on said cable, said first and second end portions of said flexible cables being respectively fixedly connected to said first and second hinge pin termination bushings, said given length of a hinge pin bushing being long enough to



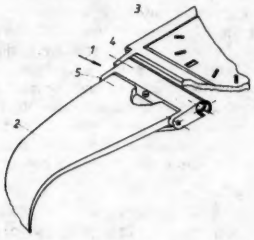
span the length of at least three aligned and adjacent hinge eyes, the ends of said hinge pin bushings being chamfered and the total of said given lengths of said hinge pin bushings being slightly less than the length of said cable between the ends of said first and second hinge pin termination bushings, and means connected to said first and second hinge pin termination bushings to retain and locate the splice clips on said hinge pin.

4,597,138

CONNECTING MEMBER FOR STRAPS, BANDS OR THE LIKE

Hermann Hirsch, Hirschstrasse 5, 9021 Klagenfurt, Karnten, Austria

Filed Jan. 10, 1985, Ser. No. 690,469
Claims priority, application Austria, Feb. 15, 1984, 490/84
Int. Cl.[4] A44C *5/14*
U.S. Cl. 24—265 B **4 Claims**



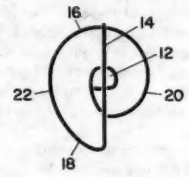
1. Connecting means for straps, by means of which a strap can be connected to an article, the connecting means comprising two parts one of which is secured to a said strap, and means pivotally interconnecting the two parts for pivotal movement relative to each other about an axis on the longitudinal centerline of the strap, the two parts having mutually facing and mutually contacting surfaces, a said surface on one said part being concave and a said surface on the other said part being convex, said surfaces being bent about an axis disposed transverse to said longitudinal centerline, said surfaces having two positions in which said convex surface nests within said concave surface, said two positions being spaced 180° apart, and spring means urging said two parts toward each other thereby yieldably to maintain said two parts in one or the other of said two positions, said parts being movable away from each other against the action of said spring means, in a direction parallel to said centerline, to permit relative pivotal movement between said two positions.

4,597,139

LARGE CAPACITY PAPER CLIP

Po C. Lau, 9224 Wilkinson Ave., North Hollywood, Calif. 91605

Filed Jan. 27, 1984, Ser. No. 574,550
Int. Cl.[4] B42F *1/02*
U.S. Cl. 24—546 **4 Claims**



1. A paper clip formed of a predetermined length of wire, said clip having a predetermined height as measured perpendicular to the edge of the paper being held, with the clip extending the greatest distance over the paper, and a predetermined width measured parallel to said edge of the paper, comprising:

one end portion of said wire forming the diameter of a substantial semi-circle, with the adjacent portion of said wire substantially forming the circumference of said semicircle;

the remaining portion of said wire forming a tight loop near the center of said one end portion;

said clip including means for preventing scratching of the paper by ends of the clip directed toward or away from the edge of the paper as the clip is being put directly onto the paper or is being removed directly from the paper;

said clip further including at least four spaced points of immediate opposition between the portion of the clip for engaging the paper on one side, and the opposing portion of the clip for engaging the other side of the paper; and

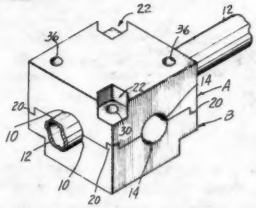
the ends of the wire forming said clip being in immediate proximity to another portion of the wire of said clip, to avoid tangling of said clip with other clips.

4,597,140

TUBE CLAMP

Donald A. Girard, Rancho Cordova, Calif., assignor to Girard Development Incorporated, Rancho Cordova, Calif.

Filed Aug. 8, 1983, Ser. No. 521,139
Int. Cl.[4] A44B *21/00*; F16G *11/06*
U.S. Cl. 24—569 **2 Claims**



1. A tube clamp affording two alternate passages for a tube to extend therethrough, comprising:

a pair of identical, tube-engaging, square blocks adapted to be secured together with inner faces in contact with each other and with an outer generally flat face and flat side walls, on each said block,

a pair of bolts for clamping said members together,

each said inner face being provided with a first generally semicylindrical groove, the said first grooves of the pair of blocks cooperating to provide a first generally cylindrical through opening perpendicular to two pairs of said side walls for receiving a tube therein,

each said inner face also being provided with a second generally semicylindrical groove perpendicular to said first groove and to the other two pairs of side walls and cooperating as a pair to form a generally cylindrical second though opening for receiving a tube therein as an alternate position for said tube,

each block having a first pair of bolt holes near the extremities of one diagonal across said outer faces and a second pair of bolt holes near the extremities of the other diagonal across said outer faces, said outer face having a bolt-head receiving recess around each of said second pair of holes, said recess having a shape complementary to the head of said bolt to prevent turning of said head when said bolt in its said hole, and

interengaging elements on the inner face of each said block to prevent said securement together in face-to-face relation except when said first and second grooves cooperate as pairs, said first pair of holes of one block then being aligned with said second pair of holes of the other block,

said flat surfaces of said outer faces enabling a nut to be turned on each flat surface when such nut is in threaded engagement with one of said bolts.

4,597,141

BELT LOCK FOR A SAFETY BELT

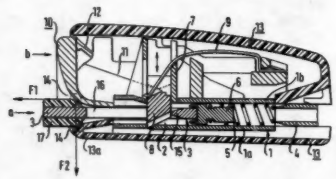
Franz Wier, Goggingen, Fed. Rep. of Germany, assignor to TRW Repa GmbH, Alfdorf, Fed. Rep. of Germany

Filed Sep. 21, 1984, Ser. No. 653,956

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1983, 3337473

Int. Cl.[4] A44B *11/26*

U.S. C 24—633 **14 Claims**



1. A safety belt lock having a lock housing forming an insertion path for a cooperating insertion tongue movable along said insertion path in opposite insertion and withdrawal directions, and a locking bar movable into said insertion path for engaging said insertion tongue, said lock housing being surrounded by a shell and having an insertion opening aligned with said insertion path, said insertion opening being at least partially defined by a flange which partially extends into said insertion path when said insertion tongue is not inserted, and which resiliently bears on said insertion tongue when said insertion tongue is inserted into said insertion opening, and said flange when resiliently bearing on said insertion tongue applying to said insertion tongue a clamping force component in said withdrawal direction and a clamping force component perpendicular to said insertion direction.

4,597,142

APPARATUS FOR CRIMPING SYNTHETIC PLASTIC CABLES

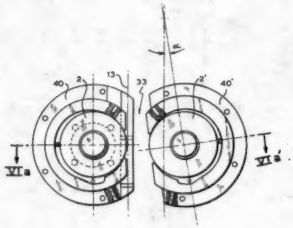
Ernst Bauch, and Ernst Vehling, both of Bordesholm, Fed. Rep. of Germany, assignors to Neumuenstersche Maschinen- und Apparatebau GmbH, Neumuenster, Fed. Rep. of Germany

Filed Sep. 4, 1984, Ser. No. 647,132

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1983, 3332387

Int. Cl.[4] D02G *1/12*

U.S. Cl. 28—269 **4 Claims**



1. A crimping apparatus for crimping synthetic plastic cables, comprising two rotary pressing rolls positioned relative to each other with a gap therebetween and forming a compression chamber at said gap, said rolls cooperating with each other to crimp a cable inserted into the compression chamber; two side plates and two intermediate elements enclosing said compression chamber at four sides thereof; means for displacing one of said pressing rolls and one of said intermediate elements enclosing said compression chamber from an operative position to a readiness position so as to enlarge said gap and open said compression chamber longitudinally and to provide between said rolls in said readiness position a passage for the insertion of the cable into the open compression chamber without requiring to stop the apparatus; and a housing having two housing portions each enclosing a respective pressing roll, said one pressing roll being connected to the assigned housing portion for displacement therewith, each of said intermediate elements being a ring open at a lateral side thereof by a cut-off segment and surrounding the respective pressing roll, each ring having surfaces limiting said compression chamber and each extended along a chord of the cut-off segment, each ring being guided in a concentrical recess in a respective one of said housing portions and means for securing each said ring in an adjusted position within the respective housing portion.

4,597,143

METHOD AND APPARATUS FOR REPROFILING WHEELS

Theodor Dombrowski, Erkelenz, Fed. Rep. of Germany, assignor to Wilhelm Hegenscheidt Gesellschaft mbH, Erkelenz, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 331,139, Dec. 16, 1981, abandoned. This application May 4, 1984, Ser. No. 607,246

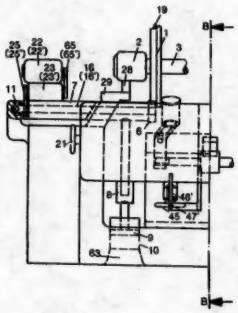
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1981, 3102091

Int. Cl.[4] B23P *7/00*; B23C *3/04*; B23B *5/28*

U.S. Cl. 29—27 R **9 Claims**

1. The method of reprofiling the wheels of a railroad wheelset by a circumferential milling operation utilizing at least one milling cutter per wheel, comprising the steps of partially supporting the wheelsets at the bearing housing thereof, causing each wheel to be engaged by drive and support rollers, providing a turning means adjacent each said wheel, causing a turning operation to be performed on said wheels at laterally limited zones within the area to be reprofiled, said turning operations being effected to a minumum depth at least sufficient to produce a circumferential clean surface throughout

said zone and a maximum depth not greater than the cutting depth needed to produce the revised profile, establishing a predetermined heightwise relation between the turning means for each of said wheels, providing a milling apparatus including milling cutter drive means adapted to mill each of said wheels, the spacing of the cutting components of each said milling apparatus from the axis of said wheelset being coordi-



nated with the spacing of said turning means for each respective wheel whereby the establishment of a predetermined spacing of each said turning means from said wheel axis also establishes a predetermined relation of a said milling apparatus and said axis, and thereafter milling the entirety of said surfaces to be profiled utilizing the position of said turning means following formation of said turned zones as a reference to establish the amount of radial infeed for said milling operation.

4,597,144

MACHINE TOOL

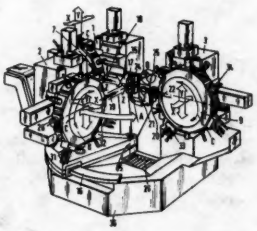
Hans-Eberhard Frank, Waldbrunn, and Norbert Petrizza, Bad Friedrichshall, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Diedesheim GmbH, Mosbach, Fed. Rep. of Germany

Filed Jul. 18, 1985, Ser. No. 756,965

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1984, 3427245

Int. Cl.[4] B23B *39/22*

U.S. Cl. 29—40 **9 Claims**



1. A machine tool, comprising:

(a) a workpiece holder supporting a workpiece so that it is immovable during operation;

(b) at least three modular identical processing units carrying tool holders each rotatable about a horizontal axis of rotation, each of the tool holders supporting at a periphery thereof a number of tools;

(c) said processing units being positioned relative to said workpiece holder so that the workpiece is treated simultaneously at least three sides thereof with said tools;

(d) means for driving said processing units along at least three axes of movement mutually perpendicular to each other;

(e) means for pivotably mounting at least one of said processing units about a vertical axis normal to one of said axes of movement and for locking said units in a respective pivoted position; and

(f) said workpiece holder being common to all said processing units and means for turnably mounting said holder about a horizontal axis from a loading position to an operation position and additionally about another horizontal axis and for locking said holder in any desired angular position, means for pivotably mounting said workpiece holder about said vertical axis.

4,597,145

TAPPING MACHINE

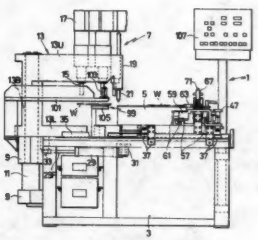
Shigeo Kasai, Sagamihara, Japan, assignor to Amada Metrecs Company, Limited, Japan

Filed Oct. 23, 1984, Ser. No. 663,935

Claims priority, application Japan, Oct. 27, 1983, 58-165398[U]

Int. Cl.[4] B23Q *1/06*; B23G *1/16*

U.S. Cl. 29—51 **8 Claims**



1. A tapping machine comprising:

a base pedestal;

a column provided on the base pedestal;

a turret installed horizontally in a freely rotatable manner on the column;

a plurality of tapping means arranged on the turret on a common arc around the column;

a worktable provided on the base pedestal for supporting a workpiece to be subjected to a tapping action;

a means for horizontally moving the worktable in a direction toward or away from the column;

a carriage means provided on the worktable having a clamp means to clamp the workpiece;

a means for horizontally moving the carriage means in the direction perpendicularly to the moving direction of the worktable;

releasable connection means connecting said worktable and said carriage means with said means for horizontally moving said worktable and said means for horizontally moving said carriage means whereby said worktable and said carriage means may be released for manual operation;

means for detecting the position of the worktable;

a control device having a memory and connected with said means for detecting the position of the worktable whereby when the worktable is manually positioned the said manual position may be entered and recorded in the memory of said control device.

4,597,146

METHOD OF MAKING BADGES OR EMBLEMS

Leo H. Larin, 5314 Colonade Ct., Cape Coral, Fla. 33904

Filed Jan. 30, 1984, Ser. No. 575,003
Int. Cl.[4] A44C *3/00, 27/00*
U.S. Cl. 29—160.6 1 Claim

1. The method of making non-transparent colored badges or emblems having front and back surfaces which comprises the steps of making a cloisonned master model of the badge or emblem having low ridges on the front surface only to confine paint to the cloisonned areas bounded by the low ridges when the badges or emblems are positioned in a horizontal position and paint is applied to the cloisonned areas, forming a plurality of specimens of the master model by a casting process, trimming and polishing the specimens, applying paint to the cloisonned areas on the front surfaces of the specimens, drying the paint, polishing the specimens to clean the cloisonned ridges, and thereafter plating the badge or emblem with a suitable plating material to cover the cloisonned ridges on the front surface only of the specimens.

4,597,147

STOP CHANGER TOOL FOR IN-SERVICE VALVE

Ralph E. Henry, Rixford, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 24, 1984, Ser. No. 654,280
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—213 R 7 Claims

1. In a stop changer tool for removal of an in-service valve exposed to line pressure, including a tubular housing adapted for effecting a pressure-tight connection with the outlet of a valve to be removed, a body tube axially supported for rotation within said tubular housing and extending between a first end adapted to be displaced past the valve connection end of said tubular housing and a second end extending outward of said tubular housing for receiving a drive connection, an elongated shaft within said body tube and threadedly connected thereto, rotational drive means connected to the drive connection end of said body tube and effective when operative to axially displace said shaft within said body tube, and a changer plug supported at the first end of said body tube and expandable in the course of said shaft displacement in a withdrawal direction for sealing an inlet pipe under pressure to which a valve to be removed is connected, the improvement in which said changer plug comprises an elongated elastomeric element responsive when axially compressed to expand in a radially outward direction, and a pair of anti-extrusion units, one of which is positioned juxtaposed at each end of said elastomeric element with each anti-extrusion unit comprising a plurality of axially contiguous elements responsive to a withdrawal displacement of said shaft to axially compress said elastomeric element therebetween while said elements concomitantly displace laterally relative to each other for axially confining the expanded elastomeric element thereat.

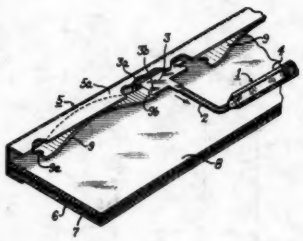
4,597,148

TOOL FOR REMOVING FRAME CLIPS

Dori-Jayne Kennedy, 21 Meleca Ave., Pittsfield, Mass. 01201

Filed Jan. 11, 1985, Ser. No. 690,740
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—230 6 Claims

1. A tool for removing spring clips from a frame wherein the spring clips are formed of a bowed compressible strip member arranged in the space between the frame and the framed material, and wherein the strip member has a recess in the end edge thereof, said tool comprising an elongated handle, a shank portion extending from said handle, said shank portion having at its outer end a flat blade portion projecting in a plane laterally therefrom, said blade portion formed with a first lateral projection at its outer end and a second lateral projection



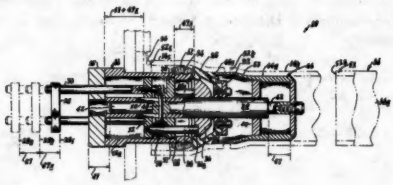
spaced inwardly from said first projection and formed to fit within the recess in the spring clip, said projections extending in said plane, whereby said blade portion may be inserted in the space between the frame and the framed material for firmly engaging the end of the clip for removing the clip from the frame.

4,597,149

MANDREL FOR FORMING AN INTERNAL ENLARGEMENT FOR A GASKET OR SEALING RING IN A PIPE OR TUBE

Robert J. Lee, 810 E. 80th St., Indianapolis, Ind. 46240

Filed Sep. 30, 1985, Ser. No. 782,108
Int. Cl.[4] B29C *17/00*
U.S. Cl. 29—235 21 Claims



1. Mandrel means for producing an interior enlargement for retaining a gasket or sealing ring in a pipe or tube work object, comprising, in combination:

a frame body means;

an outer nose which provides guide means, the outer surface of which is operatively cylindrical and provides a guide means generally concentric with the axis of the mandrel means, for slidably receiving therealong an end portion of the pipe or tube;

a circumferentially-extending expanding shoe means which is radially movable with respect to the frame body means and to the guide means, and is axially fixed with respect to the frame body means;

support means fixedly supported by the frame body means and providing support for the expanding shoe means;

movable force means movable with respect to the frame body means and to the support means;

movable actuation means, which are responsive to to movement of the movable force means, and operative to cause the expanding shoe means to move radially outwardly to a radially outward position to engage a pipe or tube work object for achieving an enlargement of the pipe or tube

work object to receive the gasket or sealing ring in said enlarged portion;

and retraction means which cause the expanding shoe means to retract radially inwardly to accommodate the release from the mandrel means of the pipe or tube work object then carrying inwardly of its enlargement the gasket or sealing ring whose release from the mandrel means would be otherwise blocked by the expanding shoe means if then remaining in its said radially outward position.

4,597,150

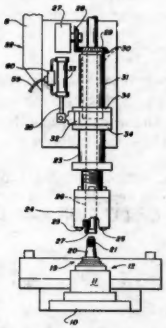
METHOD OF AND APPARATUS FOR CLOSING JOINT DEVICES TO OBTAIN CONSISTENT TORQUE VALUES

Louis P. Fister, St. Louis, Mo.; Lawrence H. Fitch, Cahokia, Ill., and Herby O. Pearson, Chesterfield, Mo., assignors to Moog Automotive, Inc., St. Louis, Mo.

Filed Feb. 25, 1985, Ser. No. 705,119

Int. Cl.[4] B23Q *17/00*; B21D *53/10*

U.S. Cl. 29—407 **12 Claims**



1. A method of assembling a ball joint in which the housing is closed over a headed stud and bearings in the housing and the torque reaction between the headed stud and bearings meets a predetermined torque value, the method comprising the steps of:

(a) placing the headed stud and bearings in an open housing;

(b) joining a rotary probe to the headed stud and initially sensing the torque reaction between the rotating headed stud and bearings during the joining of the rotary probe;

(c) cancelling out the torque initially sensed during the joining of the rotary probe to the headed stud and prior to closing of the housing;

(d) closing the housing over the headed stud and bearings and monitoring the torque reaction of the headed stud as it is rotated in the bearings by the probe; and

(e) terminating the closing of the housing upon the monitored torque reaction reaching the predetermined torque value.

4,597,151

FLUID PRESSURE TRANSMITTING DIAPHRAGM ASSEMBLY AND METHOD OF MANUFACTURE

Hooshmand Zaghi, Oxnard, and Roy K. Kodama, Thousand Oaks, both of Calif., assignors to Solartron Electronics, Inc., Princeton, N.J.

Filed Feb. 4, 1980, Ser. No. 118,455

Int. Cl.[4] B23P *17/00*

U.S. Cl. 29—421 R **8 Claims**

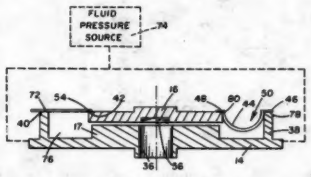
1. A method of assembling a fluid pressure transmitting diaphragm assembly of the type used in pressure transducers, said method comprising the steps of:

providing a diaphragm support plate having an upwardly extending peripheral lip with an annular, radially extending sealing surface;

providing a force transmitting disk having a peripheral, radially extending sealing surface;

providing a thin flat, annular blank of resilient material having a central opening and a peripheral edge;

hermetically welding said force transmitting disk within said central opening, the weld being between said blank and said peripheral sealing surface;



hermetically welding said blank to said support plate, the weld being between said blank and said annular sealing surface; and

applying fluid pressure to said annular blank following said welding to cause a free deformation of said blank into open space for forming a downwardly extending segmentally toroidal concave portion in said blank between said sealing surfaces.

4,597,152

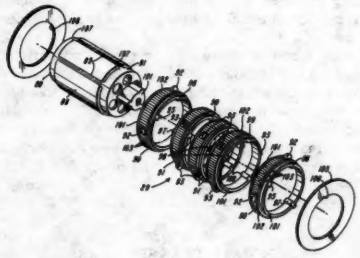
METHOD OF MAKING FEED WHEEL

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 484,349, Apr. 12, 1983, Pat. No. 4,488,671. This application Sep. 24, 1984, Ser. No. 653,181

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—433 **1 Claim**



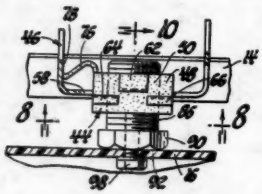
1. Method of making a feed wheel, comprising the steps of: molding a one-piece feed wheel hub from plastics material, wherein the molding step includes simultaneously providing at least two external axial grooves at different angular locations in the hub and integrally molded position indicating means on the hub in predetermined relationship to each other, molding at least one ring from plastics material with spaced external feed teeth and at least two internal projections cooperable with the grooves in one and only one rotational position, orienting the ring so that the projections are in alignment with the grooves, and sliding the ring axially onto the hub so that the feed teeth and the position indicating means are in predetermined relationship to each other.

4,597,153

METHOD FOR MOUNTING PLASTIC BODY PANEL

Wieslaw S. Zaydel, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 442,861, Nov. 19, 1982, Pat. No. 4,529,244.
This application Sep. 20, 1984, Ser. No. 652,228
Int. Cl.[4] B23P *11/00*
U.S. Cl. 29—434 1 Claim



1. A method for mounting a plastic panel on a metal substructure of a vehicle body to enable precise surface alignment of the panel relative an adjacent body panel and to accommodate thermal and hygroscopic growth of the plastic panel comprising the steps of:

attaching one end portion of the plastic panel on the metal substructure;

slidably mounting a plastic first mounting member on the metal substructure to underlie the other end portion of the plastic panel to permit movement of the first mounting member relative the one end portion of the plastic panel, said first mounting member having a plastic flexure spring integral therewith and engageable with the substructure to slidably preposition the plastic first mounting member at a certain desired longitudinal sliding position relative the fixed one end portion of the plastic panel;

adjustably mounting a second mounting member on the first mounting member via helical thread means acting between the first and second mounting members to enable rotation of the second mounting member to effect adjustment of the position of the second mounting member transversely relative to the metal understructure to thereby establish the second mounting member at a precise transverse position relative the body panel adjacent the other end portion of the plastic panel;

drilling a fastener hole in the second mounting member at a precise longitudinal position relative to the adjacent body panel; and

installing a fastener between the other end portion of the plastic panel and the second mounting member so that the plastic panel other end portion obtains a precise surface alignment with the adjacent body panel and so that the other end portion is movable longitudinally with the mounting members relative to the one end portion of the plastic panel upon thermal or hygroscopic growth of the plastic panel as permitted by yielding of the spring means.

4,597,154

STRAIN TRANSDUCERS

John Harbour, Chippenham, and John D. Barnett, Halesston, both of Great Britain, assignors to TRW Probe Electronics Co. Ltd, Cirencester, Great Britain

Filed Mar. 20, 1984, Ser. No. 591,506
Claims priority, application United Kingdom, Mar. 26, 1983, 8308372
Int. Cl.[4] B23P *19/02*; F16B *37/04*
U.S. Cl. 29—525 2 Claims

1. A method for securing a strain gauge to a member, said method comprising the steps of:

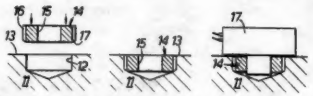
providing a cylindrical plug having a predetermined diameter;

securing said strain gauge to said plug;

providing an insert having axial serrations extending substantially the entire length thereof with a predetermined envelope peak diameter and having an interior aperture having a diameter equal to said predetermined diameter of said cylindrical plug;

drilling in said member a hole having a diameter less than said predetermined envelope peak diameter;

driving said insert into said hole in said member and causing



said serrations to cut into a wall defining said hole thereby preventing axial rotation of said insert during said driving;

positioning said cylindrical plug while external of said insert aperture to provide a predetermined orientation between said strain gauge and said member; and thereafter

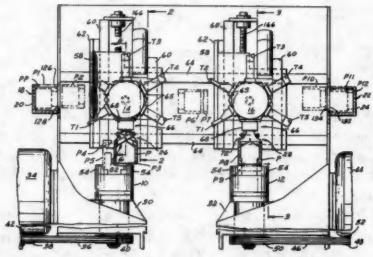
moving said cylindrical plug into said interior aperture of said insert with solely linear movement.

4,597,155

BORING MACHINE WITH WORK-HANDLING TOOL TURRET

Donald W. Garnett, Grand Ledge, and John A. Watson, East Lansing, both of Mich., assignors to The Olofsson Corporation, Lansing, Mich.

Continuation of Ser. No. 245,743, Mar. 20, 1981, abandoned.
This application Sep. 1, 1983, Ser. No. 528,554
Int. Cl.[4] B23B *15/00*
U.S. Cl. 29—564 3 Claims



1. In a machine tool for removing metal from a workpiece having internal surfaces by means of which it may be gripped, laterally spaced first and second turrets, a support for each turret, means rotatably mounting each turret on its associated support, a plurality of tools and a work-handling device having radially movable fingers capable of internally gripping the workpiece mounted on each turret in angularly spaced relation about the axis of rotation thereof, a work-holding spindle for each turret disposed in spaced relation to the axis of rotation thereof, means guiding the support for said first turret for straight line movement along a first path toward and away from the spindle associated with said first turret, means guiding the support for said second turret for straight line movement along a second path parallel to said first path toward and away from the spindle associated with said second turret, means guiding both turret supports for straight line movement along a third path at right angles to said first and second paths toward and away from each other, means for rotating each turret so as to bring a selected tool or work-handling device into alignment with the associated spindle when the associated support is in a predetermined position along said third path or to bring said work-handling devices of both turrets into alignment with each other when said supports are in predetermined positions along said first and second paths, respectively, means

for independently moving said supports along said respective first and second paths when said supports are in said predetermined positions along said third path to bring a selected tool on each turret into operative relation with the associated spindle to remove metal from the workpiece held thereby or to bring said work-handling device on each turret into operative relation with the associated spindle to load or unload said spindle depending on the rotative position of said turret, and means for moving said supports along said third path when they are in said predetermined positions along said first and second paths and when said turrets are so rotated as to align said work-handling devices to internally grip and transfer the workpiece from one work-handling device to the other, said work-handling device on each turret being adapted to internally grip the workpiece by one end thereof, the workpiece when transferred from the work-handling device of one turret to that of the other being internally gripped by the work-handling device of the receiving turret on the end thereof opposite that which was internally gripped by the work-handling device of the turret from which it was received so that the workpiece will be inverted when loaded on the spindle associated with the receiving turret, a work pick-up station adjacent said first turret, a work discharge station adjacent said second turret, means for moving the support for the first turret along a straight line toward and away from said work pick-up station when said first turret is so rotated as to align its work-handling device with said work pick-up station to internally grip and transfer the workpiece from said work pick-up station to the work-handling device of said first turret, and means for moving the support for said second turret along a straight line toward and away from said work discharge station when said second turret is so rotated as to align its work-handling device with said work discharge station to internally grip and transfer the workpiece from the work-handling device of said second turret to said work discharge station.

4,597,156

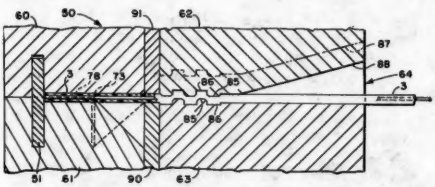
WIRE STRIPPING MACHINE

Frederick R. Ollis, Madison, Ohio, and John N. Tengler, Chico, Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 97,036, Nov. 23, 1979. This application Sep. 30, 1983, Ser. No. 537,956

Int. Cl.⁴ B23P *19/02*; H02G *1/12*

U.S. Cl. 29—564.4 **21 Claims**



1. A machine for preparing a cable for use in a cable termination assembly, such cable being of flat type including a plurality of conductors separated from each other an held in generally parallel and coplanar relationship by cable insulation, said machine comprising longitudinal slitter blade means for slitting the cable insulation between two relatively adjacent conductors of the cable in a longitudinal direction substantially parallel to such conductors, two transverse slitter blade means at respective longitudinal ends and transversely opposite sides of said longitudinal slitter blade means for slitting the cable insulation in a direction transverse to that of such conductors, said longitudinal and transverse slitter blade means operating to slit the cable insulation near an end of the cable to outline a tab of insulation at such end of the cable, and puller means for effecting relative longitudinal movement between the insulation tab and the conductors thereby to draw the ends of the conductors into such tab.

4,597,157

WIRE BEAD FORMING APPARATUS

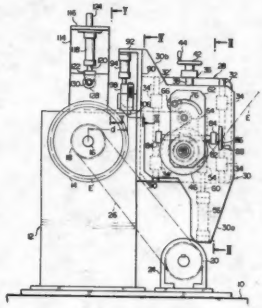
Seizo Ichikawa, Higashimurayama, Japan, assignor to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Mar. 6, 1984, Ser. No. 587,023

Claims priority, application Japan, Apr. 6, 1983, 58-60613

Int. Cl.⁴ B29D *30/48*

U.S. Cl. 29—564.8 **11 Claims**



1. A bead forming apparatus for forming a looped wire bead from a continuous line of bead forming element, comprising

(1) support means including a stationary support means;

a generally cylindrical, variable-diameter bead forming drum rotatable about an axis fixed with respect to the stationary support member;

(2) transfer means operative to drive the bead forming element toward the bead forming drum along a predetermined path and to impart a coiling tendency to the bead forming element to be passed from the transfer means toward the bead forming drum;

(3) cutting means for cutting the bead forming element at a predetermined location on said path;

(4) first retaining means for retaining the leasding end of the bead forming element extending from said transfer means at said predetermined location; and

(5) second retaining means for retaining the leading end of a cut segment of the bead forming element on the peripheral surface of said bead forming drum;

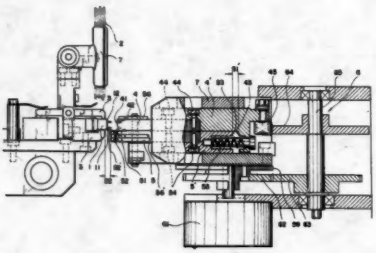
said transfer means comprising a main feed roller rotatable about an axis parallel with the axis of rotation of the bead forming drum and at least one auxiliary feed roller which is rotatable about an axis parallel with the axis of rotation of the bead forming drum and which is located posterior to the main feed roller and anterior to the bead forming drum, the auxiliary feed roller being adapted to impart a coiling tendency to the bead forming element to the pressed from the main feed roller toward the bead forming drum, said support means further comprising a movable support member which is movable with respect to said stationary support member, said main feed roller and said auxiliary feed roller being rotatably mounted on said movable support member so that said predetermined path of the bead forming element is variable with respect to said bead forming drum, said main feed roller having a center axis which is fixed with respect to said movable support member and in which said transfer means further comprises at least one support plate pivotally movable with respect to said movable support member about an axis aligned with the center axis of said main feed roller, the axis of rotation of said auxiliary feed roller being fixed with respect to said support plate and being movable with the support plate with respect to said movable support member.

4,597,158

PRESSURE CONNECTION DEVICE FOR A CONNECTOR

Haruo Hirokawa, Yokohama, and Hitoshi Miyahira, Tokyo, both of Japan, assignors to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1983, Ser. No. 502,514
Claims priority, application Japan, Jul. 15, 1982, 57-123139
Int. Cl.[4] H01R *43/04*
U.S. Cl. 29—566.3 15 Claims



1. A pressure connection device for a connector, comprising a holder for retaining in position a connector having a plurality of contacts, a guide bar for guiding and supporting at least one cable in preparation for pressure connection, and a pressure connecting rod adapted to force the cable into the corresponding contact of the connector, means for driving said pressure connecting rod, said guide bar being formed with a guide slit for guiding and supporting the cable, said pressure connecting rod being capable of moving in forward and backward directions and having a slide surface, means holding said slide surface continually in sliding contact with said guide bar, said pressure connecting rod having a front end surface serving as a cutting face adapted to shear the cable in conjunction with an edge of the guide slit of the guide bar, the front end surface of the pressure connecting rod being located behind the guide slit of said guide bar at an initial position, and after the front end surface of said pressure connecting rod is moved forward by said driving means coming into contact with and then shearing the cable by relative motion between said connecting rod and said guide bar, said pressure connecting rod is further moved forward to permit the cable to be forced into said pressure contact, to thereby establish an electrical connection and thereafter, the front end surface is returned to the initial position, said front end surface of said pressure connecting rod having escape recesses for accommodating the pressure contacts on said connector and at least one cable supporting groove for supporting said cable, and at least one keep lever adapted to push the cable into said guide slit formed in said guide bar and retain the cable in position until pressure connection of the cable to the contact of the connector is completed.

4,597,159

METHOD OF MANUFACTURING SiO_2-SI INTERFACE FOR FLOATING GATE SEMICONDUCTOR DEVICE

Toshiro Usami; Yuuichi Mikata, and Kazuyoshi Shinada, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Feb. 27, 1985, Ser. No. 706,096
Claims priority, application Japan, Mar. 9, 1984, 59-45216
Int. Cl.[4] H01L *21/02, 21/34, 21/76, 21/94*
U.S. Cl. 29—571 6 Claims

1. A method of manufacturing a semiconductor device, comprising the steps of:

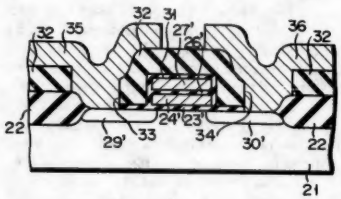
(a) forming a first insulating film on a surface of a semiconductor substrate of a first conductivity type;

(b) forming a first nonmonocrystalline silicon film on said first insulating film;

(c) depositing a second insulating film on said first nonmonocrystalline silicon film under a condition that said first nonmonocrystalline silicon film is not oxidized but that an insulating film can be deposited on said first nonmonocrystalline silicon film;

(d) ion-implanting an impurity in said first nonmonocrystalline silicon film through said second insulating film;

(e) removing said second insulating film to expose said first nonmonocrystalline silicon film doped with the impurity;



(f) forming, by thermal oxidation, an oxide film on an exposed portion of said first nonmonocrystalline silicon film;

(g) forming a second nonmonocrystalline silicon film on said oxide film; and

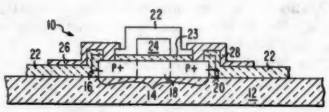
(h) forming a third insulating film on said second nonmonocrystalline silicon film.

4,597,160

METHOD OF FABRICATING A POLYSILICON TRANSISTOR WITH A HIGH CARRIER MOBILITY

Alfred C. Ipri, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 9, 1985, Ser. No. 763,968
Int. Cl.[4] H01L *21/94, 21/322*
U.S. Cl. 29—571 12 Claims



1. A method for making a transistor comprising:

forming a first amorphous silicon layer on a substrate to obtain a smooth surface on said layer;

heating said amorphous silicon layer in an oxidizing ambient at or slightly below the critical temperature of silicon to form an insulating layer on said smooth surface and to convert said amorphous silicon layer to a polycrystalline silicon layer while retaining said smooth surface;

forming a gate on said insulating layer; and

forming source and drain regions in said silicon layer adjacent said gate.

4,597,161

METHOD OF MAKING PHOTOELECTRIC CONVERSION DEVICE

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Tokyo, Japan

Division of Ser. No. 605,663, Apr. 30, 1984. This application Apr. 11, 1985, Ser. No. 722,006
Claims priority, application Japan, Apr. 29, 1983, 58-75713
Int. Cl.[4] H01L *27/14, 31/18*
U.S. Cl. 29—572 18 Claims

1. A method of making a photoelectric conversion device, comprising the steps of:

preparing a substrate formed by an insulating sheet-like member having a metallic sheet-like member and an insu-

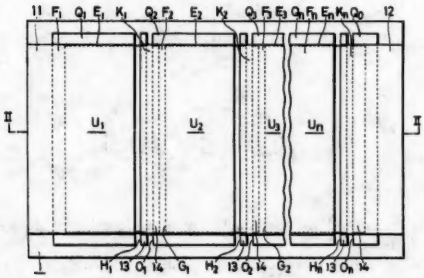
lating film having a thermal conductivity less than that of glass formed on the metallic sheet-like member;

forming a first conductive layer on the insulating film of the substrate;

forming n−1 (where n is an integer larger than 2) sequentially arranged first grooves G_1 to G_{n-1} in the first conductive layer by using a first laser beam to form n sequentially arranged first electrodes E_1 to E_n separated by the first grooves G_1 to G_{n-1}, respectively;

forming on the substrate a non-single-crystal semiconductor laminate layer having formed therein at least one semiconductor junction to cover the first grooves G_1 to G_{n-1} and the first electrodes E_1 to E_n;

forming n−1 sequentially arranged second grooves O_1 to O_{n-1} in the non-single-crystal semiconductor laminate layer by using a second laser beam to form n sequentially arranged non-single-crystal semiconductor laminate members Q_1 to Q_n defined by the second grooves O_1 to O_{n-1}, respectively, thereby to expose portions of the respective



first electrodes E_1 to E_{n-1} to the outside, where the grooves O_1 to O_{n-1} do not extend to the metallic sheet-like member of the substrate due to the low thermal conductivity of the insulating film;

forming a second conductive layer which continuously extends on the non-single-crystal semiconductor laminate members Q_1 to Q_n and extends into the grooves O_1 to O_{n-1} to provide coupling portions K_1 to K_{n-1} which are connected to the first electrodes E_1 to E_{n-1} through the grooves O_1 to O_{n-1}, respectively, and;

forming n−1 sequentially arranged isolating portions H_1 to H_{n-1} in the second conductive layer on the non-single-crystal semiconductor laminate members Q_1 to Q_{n-1}, respectively, to form n sequentially arranged second electrodes F_1 to F_n which are isolated by the isolating portions H_1 to H_{n-1}, respectively, and opposite the first electrodes E_1 to E_n through the non-single-crystal semiconductor laminate members Q_1 to Q_n, respectively, the second electrode F_{j+1} (j=1, 2, 3, . . . (n−1) being connected to the first electrode E_j through the coupling portion K_j.

4,597,162

METHOD FOR MAKING, PARALLEL PREPROGRAMMING OR FIELD PROGRAMMING OF ELECTRONIC MATRIX ARRAYS

Robert R. Johnson, Franklin, and Stanford R. Ovshinsky, Bloomfield Hills, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation of Ser. No. 513,997, Jul. 14, 1983, Pat. No. 4,545,111, which is a continuation-in-part of Ser. No. 458,919, Jan. 18, 1983. This application Oct. 7, 1985, Ser. No. 785,367

The portion of the term of this patent subsequent to Oct. 8, 2002, has been disclaimed.

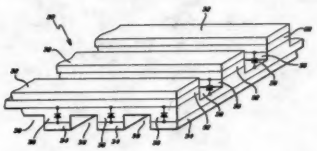
Int. Cl.[4] H01L *21/46*

U.S. Cl. 29—574 **28 Claims**

1. A method of making an electronic matrix array comprising the steps of:

forming at least one layer of phase changeable material on a substrate, said phase changeable material having a substantially nonconductive state and a comparatively high conductive state, said layer being formed in one of said states;

parallel programming said layer by irradiating selected areas of said layer to simultaneously convert said selected areas of said layer to the other one of said states to form selected substantially nonconductive portions of said layer and selected comparatively high conductive portions of said layer;



forming first and second sets of electrically conductive address lines on respective opposite sides of said layer, said address lines of said first and second sets being formed for crossing at an angle to form a plurality of crossover points; and

said selected substantially nonconductive layer portions and said selected comparatively high conductive layer portions being formed between said first and second sets of address lines.

4,597,163

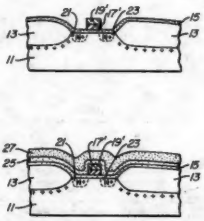
METHOD OF IMPROVING FILM ADHESION BETWEEN METALLIC SILICIDE AND POLYSILICON IN THIN FILM INTEGRATED CIRCUIT STRUCTURES

Juine-Kai Tsang, Sunnyvale, Calif., assignor to Zilog, Inc., Campbell, Calif.

Filed Dec. 21, 1984, Ser. No. 684,677

Int. Cl.[4] H01L *21/263, 21/265*

U.S. Cl. 29—576 B **9 Claims**



1. A method of improving film adhesion between polysilicon and metallic silicide layers during the fabrication of thin film integrated circuits, comprising the steps of:

providing a substrate having a polycrystalline silicon surface layer;

depositing a metallic silicide film on said substrate;

implanting in said silicide film a predetermined dose of selected ions at a predetermined energy; and

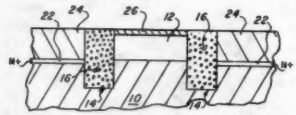
maintaining said implanted ions in said silicide film during subsequent processing steps, whereby during subsequent heat treatment tensile stress in said silicide film is reduced.

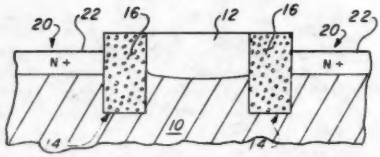
4,597,164

TRENCH ISOLATION PROCESS FOR INTEGRATED CIRCUIT DEVICES

Robert H. Havemann, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 31, 1984, Ser. No. 646,600
Int. Cl.[4] H01L *21/76, 21/265*
U.S. Cl. 29—576 W 11 Claims





1. A method for isolating a selected area on an integrated circuit device, comprising the steps of:

(a) providing a silicon integrated circuit substrate having a selected area thereon;

(b) forming a trench around the selected area;

(c) forming an insulating barrier in the trench;

(d) implanting an N+ dopant in the silicon surrounding the trench; and

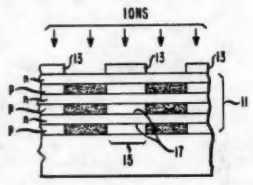
(e) thermally forming oxide on the surface of the device in the dopant implanted regions at a substantially faster rate than in the selected area.

4,597,165

METHOD OF MAKING INTEGRATED CIRCUITS EMPLOYING ION-BOMBARDED INP LAYERS

Federico Capasso, Westfield; Marlin W. Focht, Stewartsville; Albert T. Macrander, Summit, and Bertram Schwartz, Westfield, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 28, 1983, Ser. No. 555,671
Int. Cl.[4] H01S *3/18;* H01L *21/208*
U.S. Cl. 29—576 B 6 Claims



1. A method of manufacturing a device comprising the steps of

(a) providing a multilayered structure having n-type and p-type Group III–V compound layers which contain InP, and

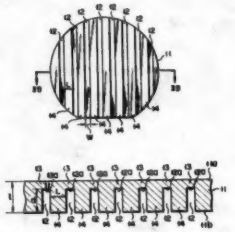
(b) bombarding at least one of said n-type layers and one of said p-type layers with ions at a dose and energy so that only said at least one p-type layer becomes highly resistive, said ions being selected from the group consisting of helium ions and deuterons.

4,597,166

SEMICONDUCTOR SUBSTRATE AND METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICE USING THE SAME

Hiroshi Iwai, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 8, 1983, Ser. No. 464,922
Claims priority, application Japan, Feb. 10, 1982, 57-20117
Int. Cl.[4] H01L *21/322, 21/461*
U.S. Cl. 29—580 16 Claims



1. A method for manufacturing a semiconductor device, comprising:

(a) providing a semiconductor substrate main body having a first major surface and a second major surface opposite thereto;

(b) forming a plurality of recesses in said second major surface, thereby defining a semiconductor element formation region between a bottom surface of a recess and said first major surface;

(c) forming a semiconductor element in said semiconductor element formation region; and

(d) subjecting said semiconductor substrate main body to a gettering treatment from said second major surface.

4,597,167

METHOD OF FORMING A METAL FILM ON A SELECTIVELY DIFFUSED LAYER

Takahiko Moriya, Yokosuka, and Saburo Nakada, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

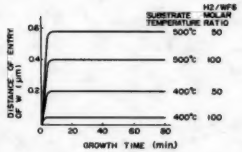
Filed Aug. 16, 1984, Ser. No. 641,191
Claims priority, application Japan, Aug. 30, 1983, 58-158713
Int. Cl.[4] H01L *21/225, 21/285*
U.S. Cl. 29—590 4 Claims

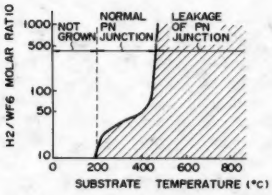
1. A method of manufacturing a semiconductor device, comprising the steps of:

introducing an impurity of one conductivity type into a semiconductor substrate of an opposite conductivity type having an insulating film formed on a surface thereof, using the insulating film pattern as a mask to form a diffusion layer; and

forming a metal film on the diffusion layer by selective vapor growth with a mixture of a metal source gas and a carrier gas used as a feed gas, said carrier gas being at least one member selected from the group consisting of a hydrogen gas and an inert gas, and said vapor growth being carried out under the condition that the substrate temperature is 200° to 400° C., and the molar ratio of the carrier gas to the metal source gas is at least 50, whereby the distance of

entry of the metal film from the edge of the insulating film pattern to the interface between the insulating film pattern





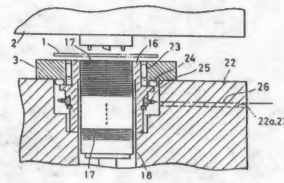
and the diffusion layer is smaller than the depth of the pn junction of the diffusion layer.

4,597,168

METHOD AND APPARATUS FOR PRODUCING LAMINATED IRON CORES

Takamitsu Oboshi, Fukuoka; Tomoaki Koga, and Eiji Imoto, both of Kitakyushu, all of Japan, assignors to Mitsui High-Tec, Inc., Yahatanishi, Japan

Filed Oct. 1, 1984, Ser. No. 656,603
Claims priority, application Japan, Oct. 3, 1983, 58-184871
Int. Cl.[4] H02K *15/02*
U.S. Cl. 29—596 **5 Claims**



1. A method for controlling the operation of a punch press apparatus for forming, from a continuous metal strip, laminated metal cores with a preset skew amount and total thickness, each core consisting of a stacked plurality of punched core pieces, each piece having an offset tab which seats within a space in the immediately underlying core piece, comprising:

rotationally skewing the previously stacked, underlying pieces with respect to a piece presently being punched by a preselected skew angle,

measuring, after each core piece is punched and stacked, the total thickness of the laminated core currently being formed,

maintaining a count of the total number of core pieces presently included in said core being formed,

terminating the formation of the core presently being formed when said measured total thickness reaches said preset value,

computing, at the termination of formation, a new skew angle $\Delta\theta_o=\theta_o/n$, where θ_o is said preset skew amount and n is the total number of core pieces in said core, the formation of which was just terminated, and

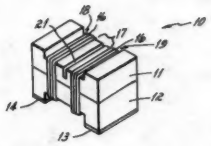
utilizing during the formation by said apparatus of the next laminated metal core, said new skew angle $\Delta\theta_o$ as said preselected skew angle.

4,597,169

METHOD OF MANUFACTURING A TURNABLE MICROINDUCTOR

Edward R. Chamberlin, Loveland, Ohio, assignor to Standex International Corporation, Salem, N.H.

Filed Jun. 5, 1984, Ser. No. 617,364
Int. Cl.[4] H01F *7/06*
U.S. Cl. 29—605 **5 Claims**



1. The method of manufacturing a tunable microinductor comprising the steps of:

bonding a magnetic bar to a nonmagnetic support,

winding a conductive coil around said bar and support in two laterally-spaced winding sections, said winding sections leaving between them an exposed portion of said magnetic bar, thereby creating an open loop inductor,

mounting said inductor in an electrical circuit,

energizing said electrical circuit, and

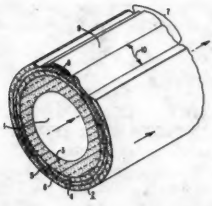
trimming away magnetic material from said exposed portion between said windings while the circuit is energized until the inductance of said inductor is such that the circuit attains the desired level of performance.

4,597,170

METHOD OF MAKING AN ELECTRODE

Arnold O. Isenberg, Forest Hills Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 28, 1985, Ser. No. 716,865
Int. Cl.[4] H01M *6/00*
U.S. Cl. 29—623.5 **15 Claims**



1. A method of bonding an electronically conductive layer on a solid, oxygen transporting oxide layer comprising:

(A) forming a coating of particles of an electronic conductor on a first surface of said oxide layer;

(B) applying a source of oxygen to a second surface of said oxide layer;

(C) applying a metal halide vapor to said first surface of said oxide layer;

(D) heating said oxide layer to a temperature sufficient to induce oxygen to diffuse through said oxide layer and react with said metal halide vapor, whereby a metal oxide coating grows on said particles of said electronic conductor.

4,597,171

TUBE-ENLARGING PRESS FOR USE IN HEAT EXCHANGER FABRICATION

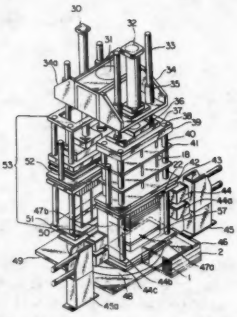
Yukio Kitayama, Oyama; Izumi Ochiai, Tochigi; Yoshio Nozawa, Tochigi; Masahiro Miyagi, Tochigi; Tadaaki Ayabe, Ibaraki, and Katsuharu Uehara, Tochigi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 17, 1984, Ser. No. 641,676

Claims priority, application Japan, Sep. 9, 1983, 58-164966

Int. Cl.[4] B23P *15/26;* **B21D** *53/02;* **B23Q** *3/00*

U.S. Cl. 29—727 **2 Claims**



1. A tube-enlarging press for fixing fins and tubes incorporated in a cross fin/tube type heat exchanger, which includes first and second clamping units for preventing the fins and tubes from being buckled, the first and second clamping units being arranged in the direction of the length of the fins and in the direction of the width of the fins, respectively, wherein each of said first and second clamping units is provided with a through hole for permitting the passage therethrough of mandrels having fallen outside the area of the fin.

2. A tube-enlarging press for fixing fins and tubes incorporated in a cross fin/tube type heat exchanger, said tube-enlarging press comprising a tube-receiving plate formed with grooves for receiving bend portions of the tubes therein, said grooves being provided in areas between positions corresponding to those of adjacent through holes formed in the fins for receiving the tubes so that said grooves extend from each of said positions in all directions to adjacent positions, and over a region of said plate corresponding to the entire area of the fin of the largest size among those of a plurality of heat exchangers to be processed by said press.

4,597,172

APPARATUS FOR MANUFACTURING ANNULAR PILES OF MAGNETIC PLATES FOR ELECTRICAL MACHINES

Raymond Bourgeois, La Tour de Scay, F-25640 Roulans, France, assignor to R. Bourgeois, Besancon, France

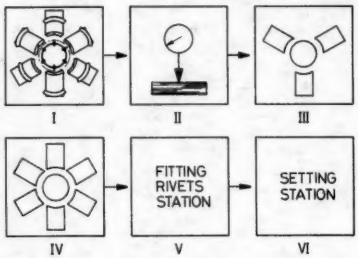
Filed Jul. 30, 1984, Ser. No. 635,421

Claims priority, application France, Aug. 9, 1983, 83 13104

Int. Cl.[4] H02K *15/02*

U.S. Cl. 29—736 **15 Claims**

1. Apparatus for manufacturing piles of magnetic plates of annular shape for electrical machines from stamped sheet metal segments having slots open toward the inside and formed by arms directed radially inwardly and growing thicker at their ends, characterised by the fact that it comprises at least one stacking station and a station for assembly by riveting, whereof the stacking station comprises: at least n magazines filled with segments of sheet metal uniformly distributed around a fitting plate of which the diameter corresponds to the inner diameter of the ring to be completed, n conveyor plates for bringing n



segments of sheet metal from n magazines against the fitting plate which is provided with n members for retaining said segments, a stacking disc located below said fitting plate provided with guide rods, at least two per sheet metal segment, engaging in corresponding slots in the segment as they drop after the withdrawal of the conveyor plates, and means for ensuring an angular stagger between two consecutive layers of sheet metal segments.

4,597,173

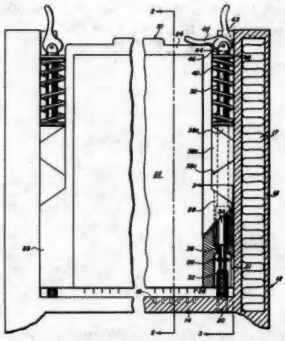
ELECTRONIC MODULE INSERTION AND RETRACTION MECHANISM

John J. Chino, Arnold; David S. Swayne, Baltimore, and Richard J. Gilmour, Pasadena, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 20, 1984, Ser. No. 622,370

Int. Cl.[4] B23P *19/02*

U.S. Cl. 29—741 **3 Claims**



1. Apparatus for inserting and retracting a printed circuit board in a chassis, said chassis including a base, two opposed walls, rows of female electrical contacts mounted in the base, and threaded openings in said base proximate each end of said rows, the board including a row of pin contacts along one side for mating with the female contacts, comprising:

a heat sink frame for mounting the board thereon and for sliding between the walls, said heat sink frame having a cylindrical bore at each end for aligning with the threaded openings;

a circumferential shoulder within each bore positioned along the length thereof intermediate of the bore ends;

an elongated shaft carried axially in each bore and threaded at one end for engaging with one of the threaded openings in the base;

a collar fixed to each shaft between said shoulder and the other end of said shaft for applying an insertion force to the board when said shaft is threaded into the base of the chassis; and

flange means removably mounted on each shaft between said shoulder and said threaded end for applying a retraction force to the board when said shaft is threaded out of the base of the chassis, the distance of said means from said collar exceeding the length of said shoulder for allowing partial thread engagement before the insertion or retraction force is applied.

4,597,174

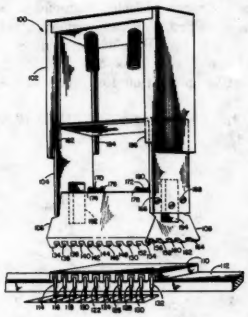
INTEGRATED CIRCUIT CHIP INSERTION AND REMOVAL TOOL

Roger Sevigny, Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 540,961, Oct. 11, 1983, abandoned. This application Sep. 13, 1985, Ser. No. 775,924

Int. Cl.[4] H05K *3/32*

U.S. Cl. 29—741 **1 Claim**



1. A hand tool for removing and inserting an IC chip (110) from its installation, comprising:

a U-shaped inner bracket (104) having two parallel legs joined by a connecting section;

a pair of pivoting jaws (106, 108) mounted along parallel pivot axes across the open end of the U-shaped inner bracket between the two parallel legs;

teeth (134–164), spaced at selected intervals along a grasping edge of each jaw, the intervals corresponding to intervals between the pins of the IC chip for insertion therebetween on the underside of the IC chip;

extension coil spring means (170, 172), connected between the pair of jaws for splaying the jaws open about their pivot axes;

insertion means (192, 194), mounted on the inside surfaces of the two parallel legs of the U-shaped inner bracket and extending within the jaws for being positioned on the surface of an IC chip grasped by the jaw, for distributing forces exerted by the inner bracket on the chip surface during insertion of an IC chip into its installation;

U-shaped outer housing guide means (102), for slideably engaging the inner bracket along its two legs during retraction and extension of the inner bracket therein and therefrom, the sliding action actuated by externally and alternately supplied, oppositely directed retracting (for extracting a chip) and extending (for inserting a chip) forces applied by hand to the connecting section of the inner bracket, the guide means for guiding the inner bracket including jaws in alternate extended and retracted directions during extension and retraction of the inner bracket, the guide means having rails (182, 184, 186) for permitting the jaws to open when the inner bracket is extended for aligning the jaw teeth between the legs of the IC chip to be removed or inserted from or into its installation, said rails interfering with and thereby forcing the jaws to close and grasp the IC chip when partially retracted into the outer housing both, for extraction,

(i) as the outer housing is forced by hand down over an inner bracket positioned for grasping an installed IC chip to be removed from its installation,

(ii) as the outer housing is seated by hand on an IC chip installation surface (112), and

(iii) as the chip is extracted from its installation during full retraction by hand of the inner bracket within the seated outer bracket by means of the teeth pulling on the underside of the IC chip,

and, for insertion,

(i) as the inner bracket is retracted by hand into the outer bracket to force the jaws to grasp a loose IC chip for insertion (before the outer housing is positioned for seating on an IC chip installation surface),

(ii) as the outer housing, with the inner bracket holding the chip fully retracted within the outer housing, is seated by hand on the surface of the chip's installation, and

(iii) as the chip is inserted into its installation during a hand actuated extending motion of the inner bracket in a direction extending out from the seated outer bracket, the insertion effected by means of the insertion means pushing on the topside of the grasped IC chip;

the rails forming angled overhanging lips of the parallel legs of the outer bracket for slideably engaging and forcing the jaws to pivot shut to a closed state during retraction of the inner bracket within the outer bracket, and for permitting the jaws to pivot open to an opened state during extension of the inner bracket outside the outer bracket; and

the U-shaped outer housing having flat surfaces at each end of its legs forming foundation means, for securing the outer bracket firmly on the surface of the installation of the IC chip such that the direction of insertion or extraction is substantially perpendicular to the installation surface.

4,597,175

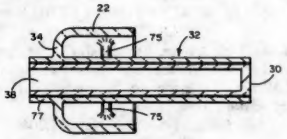
METHOD FOR MAKING INFRARED DETECTOR DEWAR

David A. K. Anderson, Irvine; James B. Gilpin, San Juan Capistrano, and Melvin J. Kniffin, Costa Mesa, all of Calif., assignors to Ford Aerospace & Communications Corporation, Detroit, Mich.

Division of Ser. No. 522,439, Aug. 10, 1983, Pat. No. 4,565,925. This application Jan. 8, 1985, Ser. No. 689,906

Int. Cl.[4] H01R *43/00*

U.S. Cl. 29—827 **3 Claims**



1. A method of making an infrared detector dewar with unitary leads, comprising the steps of:

(a) providing a first hollow glass tube;

(b) providing a leadframe consisting of a plurality of elongated electrically conductive leads connected together at their ends;

(c) positioning said leadframe to lie around said first glass

tube so that the leads are disposed generally parellel to the axis of said first tube;
(d) sliding a second hollow glass tube over said first glass tube and leadframe;
(e) applying tension to said leadframe in a direction axial of said tubes;
(f) fusing said tubes together substantially throughout their common length;
(g) cutting off the ends of said leadframe and tubes to form a stem generally in the shape of a cylinder comprising a plurality of individual glass-encased leads extending axially the entire distance between opposing first and second ends of said cut fused tubes;
(h) placing an infrared detector onto the first, generally planar, end of the stem, and, in the plane of said first end, bonding conductors emanating from the detector to glass-encased first tips of said leads; and
(i) placing said stem and detector within an evacuated enclosure such that the first end of the stem is within the enclosure and the second end of the stem is outside of the enclosure.

4,597,176

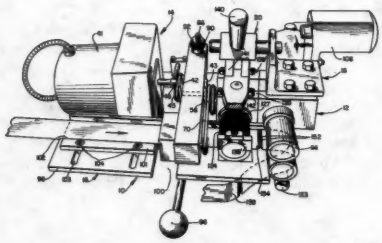
METHOD FOR REMOVING INSULATION FROM FLAT CABLE

Charles E. Shields, 655 Woodland Dr., Crystal Lake, Ill. 60014, and Leonard R. Giese, 1307 Post Dr., Rockford, Ill. 61108

Division of Ser. No. 275,838, Jun. 22, 1981, Pat. No. 4,442,587. This application Jan. 19, 1984, Ser. No. 571,998

Int. Cl.[4] H05K *3/00*

U.S. Cl. 29—829 **13 Claims**



1. A method of stripping insulation, the method comprising:
longitudinally advancing a cable which cable includes a plurality of longitudinally extending, parallel spaced conductors surrounded by insulation on a first face, on a second face, and between the conductors; and,
concurrently at a first portion of the cable, grinding the insulation transversely from the first face at a first rate and grinding the insulation transversely from the second face at a second rate different from the first rate.

4,597,177

FABRICATING CONTACTS FOR FLEXIBLE MODULE CARRIERS

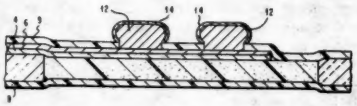
Lawrence M. Baldauf, Austin; Edward J. Girvan, Round Rock; Richard B. Overfield, Austin, and Gilbert C. Roberts, Round Rock, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 3, 1984, Ser. No. 567,704

Int. Cl.[4] H01R *43/02*

U.S. Cl. 29—878 **5 Claims**

1. In printed circuit fabrication, a method of forming contacts as an integral part of and in a substrate of gel stage epoxy glass comprising the sequential steps of:
providing holes in the substrate where contacts are to be formed;
sandwiching the substrate between layers of metal foil;
applying heat and pressure for laminating the metal foil to the substrate, curing the gel stage epoxy glass substrate and causing the substrate material to flow and fill the holes to provide a flexible surface;
forming a layer of circuit lead material;
applying a plating resist thereover;
exposing the resist to circuit patterns;
developing the resist;



etching away unexposed lead material;
stripping the plating resist;
forming a coating of photosensitive mask material;
exposing the mask to artwork;
developing the exposed mask; and
plating metallic layers.

4,597,178

SAW CHAIN SHARPENER

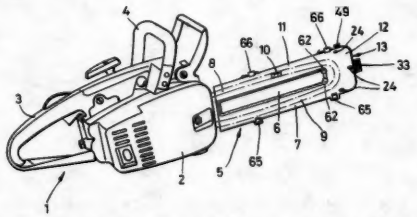
Hans Dolata, Waiblingen; Werner Meyle, Murr; Wilfried Linke, Winnenden; Hermann Hägele, Winnenden, and Ernst Buck, Winnenden, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Jun. 6, 1984, Ser. No. 617,757

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1983, 3320465

Int. Cl.[4] B23D *63/16;* **B26B** *29/00*

U.S. Cl. 30—138 **20 Claims**



1. A saw chain sharpener for a motor-driven chain saw having a motor housing and a guide bar assembly that includes a guide bar having an exposed portion extending outwardly from the housing and a saw chain guidingly mounted thereon for movement thereabout, the saw chain sharpener comprising:
an elongated chain guard casing for removably receiving and enclosing the guide bar assembly therein over substantially the entire exposed portion of the guide bar; said chain guard casing having side walls facing toward respective flat surfaces of the guide bar and defining a cavity in the forward end of said casing adjacent the nose of the guide bar; and
a sharpening device mounted in said cavity for sharpening the saw chain whereby said device is contained within said casing, said sharpening device including:
a slider slidably mounted on one of said side walls for sliding movement in said cavity;
an arcuate sharpening unit rigidly mounted on said slider;
adjustment means for manually adjusting the position of said slider so as to move said sharpening unit into contact engagement with the saw chain as the latter moves about the nose of the guide bar; and,
guide means formed in said one side wall for slidably engaging said slider at opposite ends thereof so as to prevent rotational movement of said slider and said arcuate sharp-

ening unit relative to the guide bar as said sharpening unit comes into contact engagement with the saw chain.

4,597,179

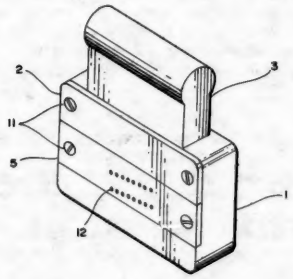
COMPONENT LEAD PROCESSOR TRIMMING AND FORMING TOOL

Sidney Goforth, 1262 N. Sugar Sands Blvd., Singer Island, Fla. 33404

Continuation-in-part of Ser. No. 490,120, Apr. 29, 1983, abandoned. This application Feb. 19, 1985, Ser. No. 703,040

Int. Cl.[4] B26B *13/00*

U.S. Cl. 30—233 7 Claims



1. A tool comprising:
a housing;
a plunger in close fitting, but linearly movable, relationship to the housing and disposed in a hollowed out portion of said housing;
a cutter blade attached to the plunger;
a perforated product die attached to the housing and positioned in a plane adjacent, but in close proximity to, a plane of linear motion of the cutter blade to effect shearing action therewith, said die being of a predetermined thickness and containing holes through which electronics components leads may project into the plane of shearing action; and
said tool further being characterized in that the holes of the product die are disposed in staggered relationship to the linear motion of the cutter blade.

4,597,180

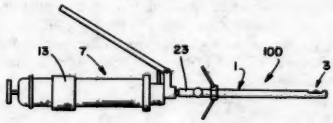
HYDRAULIC PUNCH TOOL FOR HEAT EXCHANGERS

Jackie C. Allen, Pascagoula, Miss., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jul. 31, 1984, Ser. No. 635,965

Int. Cl.[4] B26F *1/00*

U.S. Cl. 30—366 1 Claim



1. A punch tool for puncturing a hole in a tube comprising:
a hollow cylindrical member having an open end, a closed end, and a central axis running the length of the cylindrical member;
a curved surface on said hollow member coaxial with said central axis, said curved surface surrounding a slot positioned to intersect said curved surface of the member at an angle perpendicular with the central axis and substantially near the closed end, whereby the slot communicates with the hollow portion of the cylindrical member;
a generally rectangular slidable piston fit within the slot, said piston having an upper and a lower side parallel to said central axis;
means for sealing the space between the slot and the piston;
an upper and lower surface on said slidable piston, the upper surface being partially rounded to conform to the outside surface of the hollow member and the lower surface providing a support for the sealing means;
a substantially triangular cutting point attached to the slidable piston at substantially right angles to the upper side of the piston, wherein the base of the point is affixed to the upper surface of the piston whereby the height of the cutting edge will vary according to the thickness of the tube wall; and
means for forcing the slidable piston radially, whereby the cutting point may be displaced from within the hollow member to a point beyond the outside diameter of the hollow member so that a puncture results in the tube in which the tool has been inserted.

4,597,181

PLANING TOOL HAVING A QUICKLY RELEASABLE ROTARY PLANER HEAD

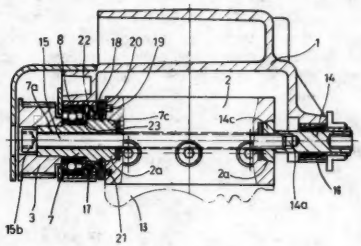
Otto Bergler, Muhlacker-Lomersheim, Fed. Rep. of Germany, assignor to Black & Decker Overseas AG, Vaduz, Liechtenstein

Filed May 11, 1984, Ser. No. 609,221

Claims priority, application Fed. Rep. of Germany, May 24, 1983, 3318745

Int. Cl.[4] B27C *1/10*

U.S. Cl. 30—475 7 Claims



1. A planning tool comprising:
a housing;
an electric motor mounted to said housing;
bearings carried by said housing;
drive shaft means supported radially and axially in said bearings;
a drive wheel connected to said drive shaft means and to said electric motor to transmit rotary motion from the latter to the former;
a planer head having an axial throughbore and being connected to said drive shaft means for rotation therewith;
said drive shaft means comprising:
a pair of bearing journals rotatably mounted in said bearings at opposite ends of said planer head, one of said bearing journals being drivably connected with said planer head and said drive wheel for transmitting rotary motion to said planer head from said drive wheel, and
threaded bolt means extending through said throughbore and being operably connected with said bearing journals for urging said planer head and said bearing journals tightly together for common rotation, said bolt means being removable from said throughbore to permit replacement of said planer head,
one of said bearing journals being axially slidable in its respective bearing and being movable axially away from said planer head in response to loosening of said bolt to accommodate removal of said planer head.

4,597,182

GANTRY-TYPE JIG

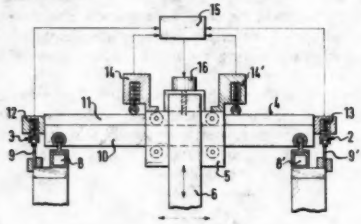
Jurgen Rinn, Am Weidacker 42, D-6301 Launsbach, Fed. Rep. of Germany

Filed Mar. 22, 1985, Ser. No. 714,926

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1984, 3410672

Int. Cl.[4] G01B 5/02

U.S. Cl. 33—1 M 9 Claims



1. A gantry-type jig for moving or positioning tools or workpieces with a high degree of accuracy along very accurate, programmed paths within the space covered by the gantry-type jig, comprising a pair of spaced-apart parallel longitudinal beams; a cross-rail mounted on said beams for longitudinal movement; and a trolley mounted on said cross-rail for transverse movement, said trolley carrying said tool; said beams and said cross-rail each comprising a load-bearing element and a positioning element, said load-bearing elements taking up substantially the full load and being subject to deflection resulting in deviations in a vertical direction, and the positioning elements being subjected to essentially no load and governing the accuracy in the vertical direction; said gantry-type jig further comprising transducers which measure the deviations in the vertical direction resulting from deflection said load-bearing elements to generate level correction signals, and means to adjust the vertical position of said tool responsive to said signals.

4,597,183

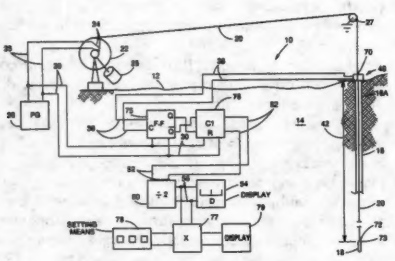
METHODS AND APPARATUS FOR MEASURING A LENGTH OF CABLE SUSPENDING A WELL LOGGING TOOL IN A BOREHOLE

Robert A. Broding, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 24, 1983, Ser. No. 469,592

Int. Cl.[4] G01B 7/26, 7/04

U.S. Cl. 33—125 W 25 Claims



8. A system for measuring depth from the mouth of a borehole to a well logging tool connected to one end of an electrically conductive cable suspended in the borehole comprising:

means for applying an initial electrical time pulse signal to one end of the cable, whereby the initial electrical time pulse signal propagates the length of the cable to one end of the cable to the well logging tool connected to the other end of the cable;

means for detecting at the mouth of the borehole, which is intermediate both ends of the cable, the passage of the initial electrical time pulse signal along the length of the cable;

means for detecting at the mouth of the borehole a subsequent electrical time pulse signal propagating along the length of the cable reflected from the other end of the cable;

means for determining a time interval between the detection of the initial electrical time pulse signal at the mouth of the borehole and the detection of the subsequent electrical time pulse signal at the mouth of the borehole; and

means for correlating the time interval with the depth to which the well logging tool is suspended in the borehole as measured from the mouth of the borehole.

4,597,184

SNAP GAUGE FOR CHECKING DIMENSIONS OF WORKPIECES

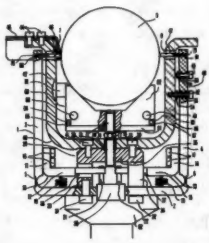
Guido Golinelli, and Mario Possati, both of Bologna, Italy, assignors to Finike Italiana Marposs S.p.A., S. Marino di Bentivoglio, Italy

Filed Aug. 27, 1984, Ser. No. 644,374

Claims priority, application Italy, Sep. 7, 1983, 3545 A/83; Mar. 7, 1984, 3371 A/84

Int. Cl.[4] G01B 5/08

U.S. Cl. 33—143 F 30 Claims



1. A snap gauge for checking dimensions of workpieces having a cylindrical surface, comprising support means; reference means with a Vee reference device for cooperating with the cylindrical surface of the workpiece; connecting means for coupling the reference device to the support means; and measuring means with two feelers movable with respect to the support means, substantially along a transversal direction, for contacting the workpiece, and with transducer means associated with the feelers for providing a signal depending on the distance between the feelers, wherein the connecting means comprise a movable connecting and adjusting element for coupling the Vee device to the support means and for permitting adjustment of the position of the Vee device along a longitudinal direction.

4,597,185

POSITIONING UNIT FOR CORE DRILL STAND

Jack R. Ury, 540 W. Highland Ave., Tracy, Calif. 95376

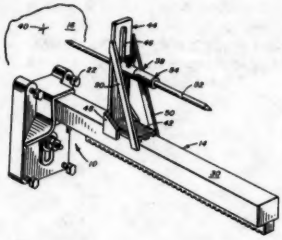
Filed Mar. 6, 1985, Ser. No. 708,802

Int. Cl.[4] B23B 49/00

U.S. Cl. 33—185 R 5 Claims

1. For use in combination with a drill stand adapted to mount and guide a core drill apparatus, said drill stand having an adjustable surface-mounted bracket with an elongate drill apparatus support bar rigid with said bracket and projecting generally perpendicular therefrom for adjustment with the bracket; a positioning unit for positioning the drill stand, independent of the core drill apparatus, relative to a predetermined

point on the surface receiving the drill stand, said positioning unit being mountable on the support bar independently of the core drill apparatus, said positioning unit comprising a base configured to conform to the support bar for transverse introduction thereon and longitudinal movement therealong, and for movement therewith upon adjustment of the adjustable bracket, said base comprising a planar base panel adapted to overlie and be supported on the support bar, and a pair of laterally spaced side members rigid with said planar base panel and projecting therefrom for reception of the support bar therebetween, a rigid support panel having a first end rigid with said base panel, said support panel projecting perpendicularly from said base panel to extend perpendicular from the support bar, a longitudinally elongate slot defined through said



support panel, a sleeve extending perpendicularly to one side of said support panel in alignment with said slot and parallel to said base panel, means mounting said sleeve for fixed positioning at selected positions along said elongate slot determinative by the core drill apparatus to mount on the stand, an elongate alignment rod slidably received within said sleeve and extending through said slot perpendicular to said support panel, and means for fixing said rod within said sleeve in a slidably adjusted position therein for selective alignment with a predetermined point on the surface receiving the drill stand upon adjustment of the surface-mounted bracket, whereby upon adjustment of said bracket to align said rod with the predetermined point, the drill stand is positioned to center the core drill apparatus relative to the predetermined point upon mounting the core drill apparatus on the drill stand support bar.

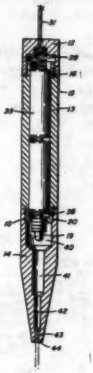
4,597,186

LIGHTED PLUMB BOB

Peter Markos, 5440 N. Braeswood, #1002, Houston, Tex. 77096

Filed Aug. 12, 1985, Ser. No. 764,609
Int. Cl.[4] G01C *15/10*
U.S. Cl. 33—392 **5 Claims**

1. A plumb bob assembly comprising a hollow elongated generally cylindrical body member, a tip mounted on one end of said body member and having a conical end portion and a passage extending longitudinally therethrough, a light bulb mounted in said assembly and adapted to emit light through said passage, battery means in said body member and in electrical contact with said light bulb, a cap member threadedly mounted on the other end of said body member and adapted when tightened against the body member to complete an electrical circuit between said battery means and said bulb to illuminate the bulb, and suspension line means attached to said cap member for suspending the plumb bob above a surface, said body member other end having a reduced-diameter end portion which is externally threaded adjacent to a top portion thereof for threaded reception thereover of said cap member, the remainder of the reduced-diameter end portion being unthreaded and serving as a storage means for said suspension line means, said storage means being accessible when said cap member is partially unscrewed from the body member to permit winding about said storage means of at least a portion of the suspension line means, and wherein the suspension line means stored within said storage means acts to prevent tighten-



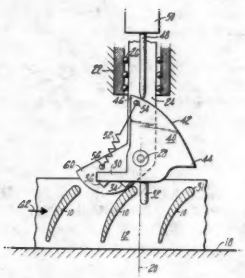
ing of said cap member to prevent inadvertent actuation of the light bulb when said plumb bob assembly is not in use.

4,597,187

COMPRESSOR VANE GAGE

Daniel L. King, Whitehall, Mich., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 19, 1984, Ser. No. 683,790
Int. Cl.[4] G01B *7/28*
U.S. Cl. 33—552 **12 Claims**



1. A gas device for measuring the quarter chord angle of a compresor vane in a row of vanes in an assembly including:
- a table supporting a vane assembly,
- a gage support above the table,
- a slide vertically movable on the support,
- a gage base pivoted on the slide and having a cam thereon,
- a transducer on the slide having a movable sensor engaging said cam,
- a plurality of gage points on the base to engage the vane at least at three spaced points and the base is turned on its pivot, and
- means for sensing when the several gage points are all in contact with the workpiece to activate the transducer.

4,597,188

FREEZE DRY PROCESS AND STRUCTURE

Edward H. Trappler, 1015 Avenue D, Parkland, Pa. 19047

Filed Mar. 4, 1985, Ser. No. 707,685
Int. Cl.[4] F26B *5/06, 3/00, 13/30*
U.S. Cl. 34—5 **18 Claims**

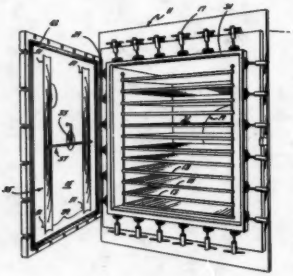
1. An improved method of freeze drying product through sublimation including the steps of:

storing frozen product to undergo lyophilization in a sealable product chamber;

subjecting said product chamber to continuous evacuation through a duct connected thereto whereby a very low atmosphere approaching a vacuum is maintained within said chamber; and

introducing small amounts of an inert gas from a supply source into said product chamber at a location opposite said evacuation duct to promote a flow across said product chamber thereby promoting flow of lyophilization vapors;

wherein the improved method comprises: regulating said introduction of inert gas by



a first pressure regulating of said inert gas to approximately 1 psig. from said source of said inert gas;

a second pressure regulating of said inert gas to approximately 1–10 millimeters of mercury pressure following said first regulation;

a third pressure regulating of said inert gas to approximately 0.1–1.0 millimeters of mercury pressure following said second regulation; and

introducing said inert gas into said chamber following said third regulation and distributing the flow of said gas once introduced into said product chamber to promote an even and uniform flow to all areas of said product chamber.

4,597,189

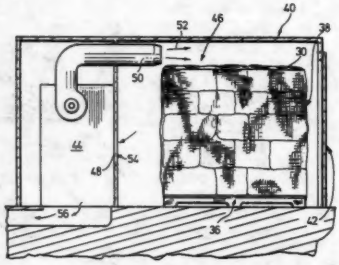
PACKAGED KILN DRIED FIREWOOD

Anthony Cutrara, R.R. #2, Burks Falls, P0A 1C0, Canada

Filed Nov. 30, 1983, Ser. No. 556,574

Int. Cl.[4] F26B *3/04*

U.S. Cl. 34—38 **10 Claims**



1. A process for kiln drying firewood consisting of essentially uniform lengths of split firewood pieces, said process comprising splitting essentially uniform lengths of green tree logs to form firewood pieces, placing said firewood pieces in open mesh bags to provide a plurality of bags of firewood, placing said plurality of bags of green firewood pieces in a kiln drying oven, kiln drying said pieces at temperatures in excess of 150° F. by moving heated air over the pieces until said pieces have an overall moisture content ranging from 15% up to 30% by weight, operating said kiln at a temperature below a level which would render the structural characteristics of the bag useless and removing said kiln dried firewood pieces in said plurality of bags from said kiln drying oven.

4,597,190

MACHINE FOR THE CONTINUOUS ROASTING OF PRODUCTS SUCH AS COFFEE AND BARLEY, AND METHOD REALIZABLE WITH THE SAID MACHINE

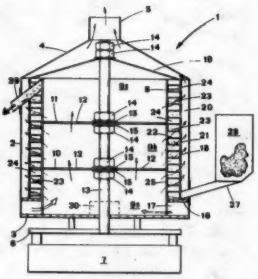
Pier Cesare P. Camerini, Casalecchio di Reno, Italy, assignor to Officine Vittoria S.p.A., Bologna, Italy

Filed Feb. 12, 1985, Ser. No. 700,682

Claims priority, application Italy, Mar. 9, 1984, 3374 A/84

Int. Cl.[4] F26B *17/10*

U.S. Cl. 34—57 A **3 Claims**



1. A machine for the continuous roasting of products such as coffee comprising:

a cylindrical casing that is closed at the top by a hood with a vent, said casing being connected to a vibrating base,

a channel shaped in the form of a cylindrical spiral about a vertical axis resting on the bottom of said cylindrical casing, said channel being disposed between an internal cylindrical liner and an external cylindrical liner, said internal cylindrical liner defining an internal chamber within said machine, said external cylindrical liner being closed at its top by a cover, said cover being within said closed cylindrical casing, said channel having an inner surface, an outer surface, and a transport surface, said transport surface being adapted to transport said products upwardly through said spiral-shaped channel when said casing is vibrated,

a hopper in communication with said channel through an infeed duct connected to said channel at its base,

means in communication with said channel for discharging said products from said machine as said products reach the top of said spiral-shaped channel,

means for blowing heated air into said internal chamber at its bottom, and

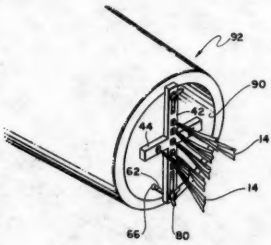
at least one vertically adjustably mounted diaphragm in said internal chamber, said diaphragm having adjustably sized holes therein for restricting flow of heated air upwardly through said chamber,

said outer and transport surfaces, but not said inner surface, of said channel being permeable and in communication with said internal chamber so as to permit said heated air to flow past said products in said channel and outward from said machine through said vent.

4,597,191
HAIR TREATMENT APPARATUS

Adrienne L. Juzefczyk, 315-J Acebo La., San Clemente, Calif. 92672

Filed Oct. 9, 1984, Ser. No. 659,177
Int. Cl.[4] A45D *19/00*
U.S. Cl. 34—60 11 Claims



1. An apparatus for treating hair comprising:

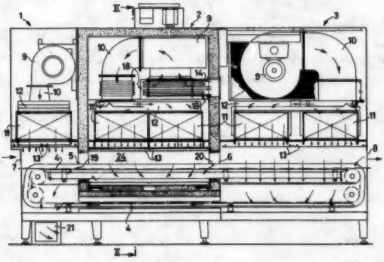
a support means having a plurality of apertures; and

hair treatment means removably connected to said support means for transferring at least one treating agent to the hair with an air current passing into contact with said hair treatment means, said hair treatment means comprising a plurality of flexible web substrates, each substrate carrying a treating agent, each of said substrates having a fastener means for removable connection to said support means, said substrates being connected to said support means at selected locations thereon by their respective fastener means being inserted into respective apertures.

4,597,192
TUNNEL-TYPE APPARATUS FOR CONTINUOUSLY STERILIZING CONTAINERS FOR THE PHARMACEUTICAL INDUSTRY

Francesco Sfondrini, Milan, and Giancarlo Corelli, Sesto San Giovanni, both of Italy, assignors to PROT S.r.l., Milan, Italy

Filed Nov. 16, 1984, Ser. No. 671,966
Claims priority, application Italy, Feb. 17, 1984, 19690 A/84
Int. Cl.[4] F26B *15/18*
U.S. Cl. 34—66 2 Claims



1. Apparatus for sterilising articles, said apparatus comprising:

(a) a sterilisation space having lateral walls, an inlet, and an outlet;

(b) a mesh conveyor belt which passes through said sterilisation space via its inlet and its outlet and which, during use of the apparatus, conveys the articles to be sterilised through said sterilisation space;

(c) an airtight outer jacket laterally surrounding said sterilisation space, said airtight outer jacket being in fluid communication with said sterilisation space between said mesh conveyor belt;

(d) a fan having an inlet and an outlet, the inlet of said fan being in fluid communication with said airtight outer jacket, thereby maintaining a lower pressure in said airtight outer jacket than is present in said sterilisation chamber during use of the apparatus, and the outlet of said fan being in airtight fluid communication with an airtight fluid conduit leading to said sterilisation space above said mesh conveyor belt, said airtight fluid conduit being entirely contained within said airtight outer jacket;

(e) means for heating air forced through said sterilisation space by said fan to sterilisation temperatures, said means being located upstream of said fan;

(f) a filter located in said airtight fluid conduit, said filter being sized, shaped, and positioned to filter all the air forced through said airtight fluid conduit by said fan; and

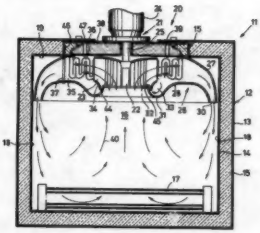
(g) a perforated plate located in said airtight fluid conduit, said perforated plate being sized, shaped, and positioned to produce a laminar flow of the air forced through said airtight fluid conduit by said fan which passes over the articles to be sterilised, through said mesh conveyor belt, and into said airtight outer jacket,

whereby, if a leak occurs in said airtight fluid conduit, the air will flow from the airtight fluid conduit into said airtight outer jacket rather than vice versa.

4,597,193
SHRINKING TUNNEL

Karl-Heinz Kallfass, Nürtingen, Fed. Rep. of Germany, assignor to Kallfass Verpackungsmaschinen GmbH, Fed. Rep. of Germany

Filed Sep. 28, 1984, Ser. No. 655,926
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1983, 3335790
Int. Cl.[4] F26B *9/06*
U.S. Cl. 34—224 12 Claims

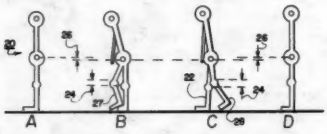


1. An apparatus for shrinking a film envelope onto piece goods by application of hot air, comprising: a hot air current assembly disposed inside a shrinking chamber defined by chamber walls, the hot air current assembly having a fan casing directing hot air in a current circulation path out of a circumferentially arranged outlet of an annular shape formed by the casing, and back into a central inlet of said casing, the hot air current assembly further comprising a fan rotor member associated with and connected to a drive motor for driving the hot air in the current circulation path, an air heating means and a support member, the support member being a base plate inserted as a wall part into an opening of one of the chamber walls, and wherein the entire hot air current assembly is mounted inside the shrinking chamber by fixing the base plate to said one of the chamber walls.

4,597,194
BIASED-TENSIONED AUXILIARY OUTSOLE MEMBER FOR SHOES

Boris Schwartz, 625 Lafayette Ave., Hawthorne, N.J. 07506

Filed Nov. 9, 1984, Ser. No. 669,685
Int. Cl.[4] A43B *3/16*
U.S. Cl. 36—7.1 R 9 Claims



1. An auxiliary outersole member that is selectively mountable and removable from a conventional foot covering as and when worn by a user, this auxiliary member adapted to store and release energy as the user makes a striding motion when walking, jogging, running and combinations thereof, this auxiliary member including:

(a) a boat-like upper member including an attached toe and heel sole portion, this upper member adapted to fit snugly over and on the lower portion of a foot covering of a user;

(b) a resilient sole portion sufficiently flexible to be bent to the configuration of the sole of the foot covering, with this sole portion extending from the toe and heel portions and unattached to the sides of said upper member, said sole portion being fixedly attached at and to the toe and heel portions to form a substantially continuous sole protective member which provides an outer contact surface, and

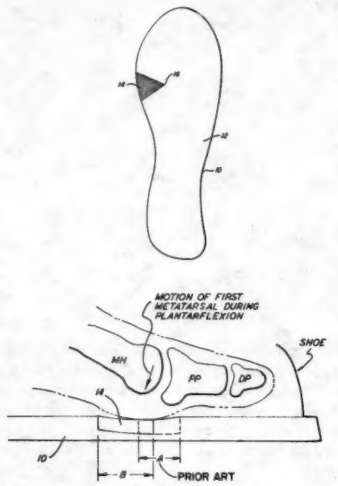
(c) a band portion which includes a plurality of substantially like strips and disposed above said sole portion and extending between the toe and heel sole portions and securely attached thereto, this band portion initially stretched when the auxiliary member is in mounted condition and, with each stride of the user, bending of the sole of the foot covering causing a further stretching of the band portion from its initially stretched condition, and when the user brings his foot covering to a substantially flat "at rest" condition the energy of bending resulting in the further stretching of band portion is recovered.

4,597,195
HUMAN SHOE SOLE

Howard J. Dananberg, 700 Maple St., Manchester, N.H. 03104

Filed Apr. 11, 1984, Ser. No. 598,712
Int. Cl.[4] A43B *13/18*
U.S. Cl. 36—28 13 Claims

1. A human shoe sole having a foot supporting upper surface, a portion of said sole, extending from said upper surface into said sole and underlying substantially only the location of the first metatarsal head of a wearer's foot, being of reduced support relative to the remainder of said sole to provide less resistance to downward motion than the remainder of said surface to facilitate eversion and plantarflexion of said metatarsal head, wherein said portion does not extend forward of said first metatarsal head.



4,597,196
ORTHOTIC INSERT AND METHOD OR MAKING OF THE SAME

Dennis N. Brown, Custer, Wash., assignor to Northwest Podiatric Laboratories, Inc., Blaine, Wash.

Continuation-in-part of Ser. No. 643,823, Aug. 24, 1984. This application Aug. 15, 1985, Ser. No. 766,049
Int. Cl.[4] A43B *13/38, 13/40*
U.S. Cl. 36—44 20 Claims

1. A substantially unitary orthotic adapted to be placed in an article of footwear, said orthotic having a longitudinal center axis parallel to a lengthwise portion of a foot for which the orthotic is used, a transverse axis, a front portion, a rear portion and two side portions, said orthotic comprising:

a. a first upper relatively flexible blank portion extending laterally across a plantar area of said foot and extending longitudinally from a heel portion of the foot to at least a metatarsal head of said foot;

b. a second lower relatively rigid cap portion positioned below said first blank portion and extending from the heel portion of the foot to a location rearwardly of a metatarsal joint of said foot, and also extending laterally across the plantar area, said cap portion having upwardly extending side walls along at least the side portions of the orthotic;

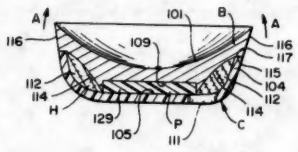
c. a moldable insert positioned intermediate said blank portion and said cup portion and comprising at least a rear heel portion positioned at a rear portion of the heel of the foot, and at least one side portion positioned at an inside side portion of the orthotic;

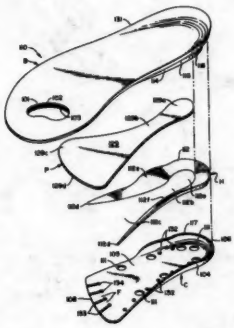
d. a relatively flexible and resilient pad portion having a rear heel portion underlying a middle heel portion of the foot, and a forward portion underlying a forward portion of the foot located rearwardly of the metatarsal joint;

e. said orthotic being characterized in that said insert is molded to conform to contours of the foot;

f. said orthotic being characterized in that the orthotic is relatively flexible along said longitudinal center axis in that the side portions of the orthotic can deflect moderately out-

wardly, and also deflect upwardly and inwardly to cradle the person's foot when weight is being taken off the foot; whereby upon initial ground contact the side portions of the





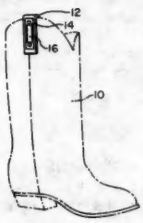
orthotic restrain outward expansion of side portions of the foot, while the orthotic cushions initial impact, and with the foot terminating ground contact, resiliency of the insert aids departure of the foot from ground contact.

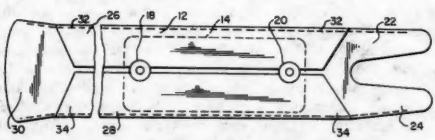
4,597,197

PERSONALIZED BOOT PULLSTRAP

David T. Strasinger, Nashville, Tenn., assignor to The United States Shoe Corporation, Cincinnati, Ohio

Filed Aug. 2, 1985, Ser. No. 762,243
Int. Cl.[4] A43B *11/00, 23/25*
U.S. Cl. 36—56 **4 Claims**





1. A personalized pullstrap for a boot comprising:

(a) an elongated flat strip having:

(i) turned under sides reinforcing the bottom surface of the strip, extremities of said turned under sides defining an open longitudinal channel;

(ii) opposed ends of the strip adapted for folding under and in parallel with the bottom surface of said strip;

(b) a pullstrap plate secured to the top surface of the strip by rivets extending through said plate, the strip and the strip channel, said rivets engaging extremities of the channel, said name panel forming a depression therein to confine a name plate insert;

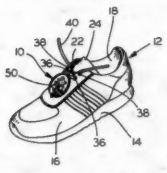
(c) a personalized name plate insert attachable to the pullstrap plate within the depression thereof.

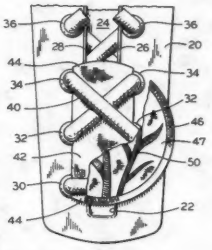
4,597,198

ORNAMENTAL ATTACHMENT FOR FOOTWEAR AND THE LIKE

David W. Schweitzer, 409 Shenipsit Lake Rd., Tolland, Conn. 06084

Filed Feb. 10, 1984, Ser. No. 579,185
Int. Cl.[4] A43B *3/24, 23/24*
U.S. Cl. 36—100 **9 Claims**





1. In combination with an article of footwear having an upper with a toe portion, opposed flaps having a multiplicity of pairs of cooperating apertures in opposed edges thereof, and a lace extending through said cooperating apertures, the pair of apertures adjacent said toe portion being designated the lowermost pair, an ornamental attachement engaged with said lace and overlying a portion of said article of footwear, said attachment including a face member overlying a portion of said lace adjacent said toe portion and a support member nonreleaseably attached at its ends to said face member to define a passage between said ends extending generally transversely to the direction of said opposed flaps, said lace extending through said passage as said lace is crisscrossed between at least two pairs of said apertures to secure said attachment on said article of footwear, at least the portion of the lace extending from the uppermost pair of apertures being spaced upwardly from said ornamental attachment and being exposed during use of the article of footwear.

4,597,199

SAFETY SHOE

Steve Hong, No.590-2, Chung Cheng Road, Tsao Tun Chen, Taichung, Taiwan

Filed Feb. 6, 1985, Ser. No. 698,696
Int. Cl.[4] A43B *5/00, 23/08, 23/10*
U.S. Cl. 36—114 **1 Claim**

1. A safety shoe which is similar to the structure and function of a sport shoe, comprising:

a conventional tennis shoe type sole consisting of a bottom sole, a steel plate provided at the front end with a plurality of slots to increase the flexibility of said sole and to allow the wearer's foot to be easily bent, said plate being connected to the top of said bottom sole and an outer sole provided around its periphery with a fixing wall being attached to the top of said steel plate, the front end of said fixing wall being provided with a plurality of first holes, two pairs of first and second recesses being respectively formed on the opposite sides of said fixing wall;

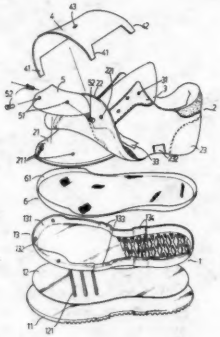
a shoe upper face attached to the fixing wall of said outer sole being divided into a vamp section and two side por-

tions, said vamp section provided at the front end with a plurality of second holes corresponding to said first holes of said outer sole, said side portions provided on the opposite sides with two pairs of first and second pockets corresponding to said first and second recesses of said outer sole, a toe lining provided at the front end with a plurality of fourth holes corresponding to said second holes of said vamp section, said lining being attached to the inner face of said vamp section;

a front cover provided around its periphery with a plurality of third holes corresponding to said first, second and fourth holes positioned between said vamp section and toe lining and secured thereto;

a plurality of rivetting members corresponding to said third holes of said front cover being passed in sequence through said first, second, third, fourth holes and rivetted thereon to provide a reinforced attachment for said front cover;

a facing provided along inner margins of the side portions



with a plurality of eyelets through which a lace may pass partly overlapping said side portions of said shoe upper face and extending to the vamp section of said shoe upper face to provide a flexible adjustment for the tightness or looseness of the joint girth of the wearer, a pair of fixing laces being respectively anchored on the opposite sides of said facing;

a protecting cover provided on the opposite sides with two pairs of first and second legs corresponding to said first and second pockets of said side portions overlaying said facing with its first and second legs respectively inserted into said first and second pockets of said side portions and supported on said first and second recesses of said outer sole, said protecting cover further provided with two properly spaced apertures through which said fixing laces may pass to fix said protecting cover in position;

an insole provided with a front wall being positioned on the top of said outer sole to prevent the wearer's toes from directly contacting said rivetting members.

4,597,200

DETACHABLE COUPLING FOR A SUCTION HEAD

Paulus van der Meer, Zevenhuizen, and Jan P. Koert, Nieuw Lekkerland, both of Netherlands, assignors to IHC Holland N.V., Papendrecht, Netherlands

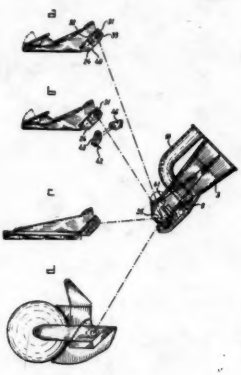
Filed Oct. 29, 1984, Ser. No. 666,219

Claims priority, application Netherlands, Oct. 28, 1983, 8303725

Int. Cl.[4] E02F *3/92*

U.S. Cl. 37—63 **6 Claims**

1. A suction pipe for a trailing suction dredger, comprising a suction tube having at its lower end a flange, a connection piece having a flange connected to the flange of the suction tube, the connection piece having an inner cross section which gradually changes from circular at its flange into rectangular at its other end, a trailing head on said other end of the connection piece, the connection piece having bearing housings thereon, two transversely extending horizontal shafts each of which partly extends into the trailing head and partly into said bearing housings, and detachable couplings removably interconnecting said bearing housings with the connection piece,



said connection piece having recesses which are open at the top and closed at the bottom and are disposed on either side of a lower portion of said other end of the connection piece, said recesses having guide surfaces which slidably receive said bearing housings, and said couplings releasably securing the bearing housings in said recesses.

4,597,201

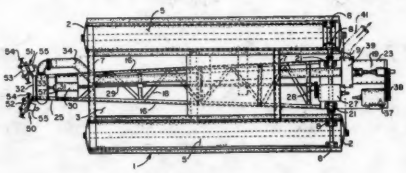
ANGLED BOOM DREDGE SYSTEM AND CUTTERHEAD THEREFOR

Malcolm L. Holekamp, 344 Gray Ave., St. Louis, Mo. 63119

Filed Apr. 8, 1985, Ser. No. 721,049

Int. Cl.[4] E02F *3/90*

U.S. Cl. 37—64 **1 Claim**



1. A dredge comprising floatation means spaced to define between them a longitudinal well through the length of said dredge fore and aft; an elongated boom tending along said well and having an outer, free end projecting forward of the bow of said dredge; pivot means near the end of the boom opposite the free end for pivotally mounting said boom on said floatation means at the stern of said dredge; means for moving said boom free end about said pivot; a pump mounted on said boom adjacent the free end thereof, said pump having an inlet mouth directed generally in the line of the long axis of said boom; disc-cutter means supported by said boom, said disc-cutter means including a pair of discs, one on either side of the said inlet mouth, and cutters mounted on the peripheries of said discs and extending radially outwardly therefrom, and means for rotating said discs, said discs being mounted on axes of rotation lying at an acute angle to a continuation of the long axis of the boom beyond the free end thereof, whereby the discs are tilted toward the inlet mount of the pump means at

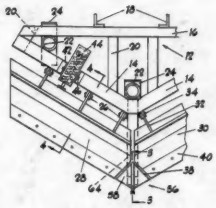
their near sides, and the axes of rotation of said discs are also at an upward angle with respect to the plane of the lower surface of said boom, whereby the axes of rotation of the discs are more nearly perpendicular to the vertical than is the axis of the boom, said discs being so mounted that they extend below the lower surface of said boom, the discs being rotated in the directions in which the cutters along the lower reach of the disc move toward said inlet mouth.

4,597,202

V-SHAPED HIGHWAY SNOW PLOWS

Warran D. Weeks, Kalamazoo, Mich., assignor to Root Spring Scraper Company, Kalamazoo, Mich.

Filed Nov. 21, 1984, Ser. No. 673,679
Int. Cl.[4] E01H *5/06*
U.S. Cl. 37—232 **9 Claims**



1. A V-shaped highway snow plow having a generally horizontal V-shaped under frame with a transverse rear member connected at its ends to forwardly converging side members and having laterally spaced uprights near the center of the rear member adapted to be connected to a truck, and roadway engaging support shoes depending below the frame, said plow being characterized by having:

alined pivot supports carried by each of said side members,

a pair of individual forwardly convex moldboards with pivot connectors on their rear sides mounted on said pivot supports, one moldboard on each side member, said moldboards being mounted independently of each other,

a pair of spring abutments carried by said under frame in generally perpendicular relation to said side members, springs anchored by said spring abutments,

and pressure members connected to the backs of said moldboards and co-acting with springs to bias the upper edges of said moldboards rearwardly about said pivot connections,

the upper portions of the inner edges of said moldboards being biased to normally be in closely adjacent relation by said springs, either of said moldboards upon striking an obstruction, pivoting about its associated pivot support to compress said spring independent of the motion of the other moldboard.

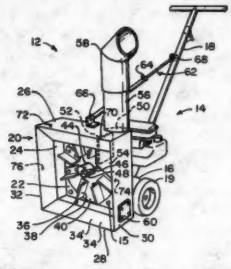
4,597,203

CONVERTIBLE SNOWBLOWER USING RECTANGULAR SHROUD INTERFACE

Carlisle A. Middleton, 38 Dungarrie Rd., Baltimore, Md. 21228

Filed Aug. 12, 1985, Ser. No. 764,712
Int. Cl.[4] E01H *5/00*
U.S. Cl. 37—241 **23 Claims**

1. A system of wheeled vehicle comprising a basic snowblower unit with first wheels for engaging a supporting surface, with power source and with means for performing additional functions useful in domestic and commercial applications under power, comprising: the snowblower having a rectangular shroud with rear face, open forward face, top, bottom, left and right sides, a fan in the shroud, means for powering the fan including: first drive means having a shaft with an end extending from said power source into the shroud, means for powering the means for performing additional functions including: a first drive member on said end a frame, second drive means comprising a second drive member attached to the frame, means for holding the first and second drive means in operative alignment for supplying power to said



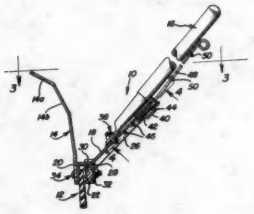
means for performing additional functions; means for affixing to the shroud said means for performing additional functions, including: said frame proportioned for fitting against the shroud, and means for detachably affixing the frame on the shroud.

4,597,204

SNOW PUSHER WITH ADJUSTABLE HANDLE

Donald J. Heiden, 2520 Central Ave., Cody, Wyo. 82414

Filed Jun. 5, 1985, Ser. No. 741,624
Int. Cl.[4] E01H *5/02*
U.S. Cl. 37—285 **2 Claims**



1. A snow pusher comprising an elongated, rigid snow diverting member, said member being generally in the form of a rectangular plate oriented vertically with the upper edge portion including horizontal portions inclined forwardly in the direction of snow to be pushed, an elongated blade extending continuously from end to end of said plate along the lower edge thereof and forming a vertical continuation of said plate, said blade being constructed of resilient, wear-resistant material for sliding movement on a surface from which snow is to be removed without catching on irregularities in said surface, a push handle extending in an upwardly inclined manner from said plate opposite to the inclined horizontal portions, and means connecting the lower end of the handle with said plate to enable the pusher to be manually operated by exerting longitudinal thrust on said handle, said means connecting the handle with said plate including an elongated angle iron member having a vertical flange attached to the rear surface of the lower edge of said plate and a horizontal flange extending rearwardly from the top edge of the vertical flange, fastening means extending through the lower edge of said plate, through said vertical flange and through the upper edge of said blade for removably mounting the blade from said plate, a mounting plate having an arcuate edge portion and a straight edge portion in opposed relation to the arcuate edge portion, the straight edge portion of said mounting plate engaging the rear edge of said horizontal flange of the angle iron member and including a downwardly extending mounting flange oriented

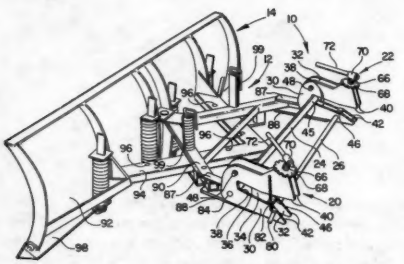
vertically and a pair of forwardly projecting tabs oriented horizontally and engaged with the top surface of the horizontal flange, said mounting plate extending upwardly and rearwardly from the rear edge of said horizontal flange, said fastener means including centrally located fastener means extending through the mounting flange to securely mount the mounting plate from the plate forming the snow diverting member, said arcuate edge portion of the mounting plate including a depending flange with spaced apertures therein, said handle including a collar on one end, a pivot bolt extending through the end of the collar and said mounting plate at the center of curvature of the arcuate flange for pivotal movement about an axis inclined upwardly and forwardly toward the plate forming the snow diverting member, a reciprocating latch pin mounted on said handle adjacent the arcuate flange for engaging the apertures in the arcuate flange to enable adjustment of the handle about the inclined axis, spring means biasing the pin toward said arcuate flange, and an operating rod connected to the end of the pin remote from the arcuate flange and extending substantially throughout the length of the handle to enable retraction of the pin to enable angular adjustment of the handle.

4,597,205

SNOW PLOW CLAMP ASSEMBLY

William H. Guest, Guest Industries, Inc., 3601 Winsted Rd., Torrington, Conn. 06790

Filed May 4, 1984, Ser. No. 606,928
Int. Cl.[4] E01H 5/06
U.S. Cl. 37—241 17 Claims



1. A clamp assembly adaptable for mounting a snow plow to the lip of a loader bucket comprising:

a pair of receiving frames disposed in a generally upright spaced relationship and forming generally laterally extending slots defined by upper and lower contact means and a rearward slot apex;

ramp means at each said apex disposed in an inclined orientation relative to said upper and lower contact means to engage a bucket lip received in said slot so that said lip is urged into a secure wedge type engagement with said ramp means, upper contact means and lower contact means;

support means transversely extending between said receiving frames to rigidly interconnect said frames;

clamp means mounted to the receiving frames comprising a pivotally mounted clamp member positionable to clamp said lip to said frames;

lock means to lock each said clamp means at a plurality of selected positions; and

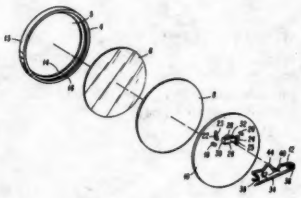
connector means to pivotally mount a snow plow to said frames.

4,597,206

SNAP TOGETHER BADGE AND CLIP

Ryan H. Benson, 2023 Mallory St. SW., Cedar Rapids, Iowa 52404

Filed Oct. 9, 1984, Ser. No. 658,924
Int. Cl.[4] A44C 3/00
U.S. Cl. 40—1.5 11 Claims



6. A display badge for display of information or decorative matter, to be worn attached to the clothing of the wearer comprising

an open frame comprising a narrow endless band enclosing a fixed area,

a substantially transparent cover which is receivable by said frame,

a backplate which is insertable within said frame,

said area enclosed by said open frame being substantially identical in shape to the shapes of said cover and said backplate,

said open frame having a first plurality of protrusions depending from said frame into the enclosed area of said frame,

said protrusions arranged upon said frame in generally symmetrical relationship,

said open frame having a second plurality of protrusions depending from said frame into the enclosed area of said frame,

said second plurality of protrusions disposed a fixed distance from said first plurality of protrusions,

said transparent cover abutting said first plurality of protrusions when said transparent cover is received by said open frame,

said second plurality of protrusions being of such size to permit the interfering passage of said backplate into said open frame,

said fixed distance between said first plurality of protrusions and said second plurality of protrusions being substantially equal to the thickness of said cover, said backplate, and the information or other printed matter to be displayed in said badge,

said printed matter being inserted within said open frame to abut said substantially transparent cover,

said backplate being received by said open frame and abutting said printed matter,

said backplate having a rear surface disposed to the exterior of said badge when said backplate is inserted within said frame,

said backplate having a fastener for detachable fastening of said display badge to the clothing of the wearer,

said backplate has an opening therethrough,

said backplate has pair of ramp elements formed upon said backplate,

said ramp elements are formed in diametrically opposing relationship with reference to said opening,

said backplate has a pair of protrusions depending from said backplate,

said pair of protrusions positioned in diametrically opposing relationship with reference to said opening,

each of said ramp elements having an inclined surface,

the portion of said inclined surface of each of said ramp elements which is most distant from the plane of said backplate being a fixed distance from said protrusions,

a bridge element traversing said opening,

said bridge element positioned such that a line through the axis of said bridge element passes adjacent the portion of the inclined surface of said ramp elements most distance from the plane of said backplate,

said bridge element positioned a fixed distance from the plane of said backplate and parallel thereto,

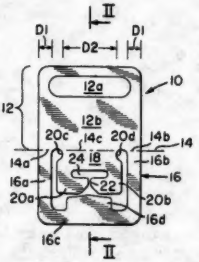
said fastener comprising a wire clasp having an S-shaped body receivable within the space between said bridge element and the plane of said backplate and positioned such that each end of the body of said wire clasp is receivable within the space between each of said ramps and each of said protrusions.

4,597,207

IDENTIFICATION TAG

George Smilow, 16821 Pinata Dr., San Diego, Calif. 92128, and Samuel L. Kayen, 116 Nassau St., Elmont, N.Y. 11003

Filed Jul. 6, 1984, Ser. No. 628,428
Int. Cl.⁴ G09F *3/08*
U.S. Cl. 40—20 R **19 Claims**



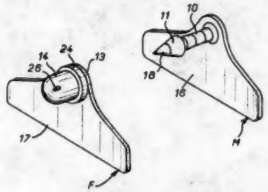
1. An identification tag for releasable securement to a garment, said tag comprising an elongate unitary body defining a base expanse extending longitudinally from one end of said body to a location intermediate said body one end and a second end thereof, first and second portions of said body extending longitudinally from said base expanse at said location and being mutually deflectably supported by said base expanse for receipt therebetween of said garment to biasingly engage said garment, said second body portion including means for receipt and retention therein of a further separate part of said garment, said means comprising a slot for the receipt of such separate garment part and an entry passage for disposing said separate garment part in said slot.

4,597,208

CATTLE IDENTIFICATION TAG

Béatrix B. Chevillot, Vincennes, France, assignor to Chevillot, Paris, France

Filed Aug. 14, 1984, Ser. No. 640,921
Claims priority, application France, Aug. 25, 1983, 83 13722
Int. Cl.⁴ G09F *3/00*
U.S. Cl. 40—301 **13 Claims**



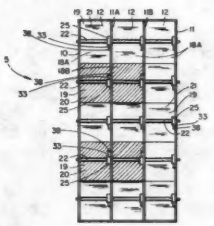
1. A cattle identification tag comprising a male part adapted to be snapped into a female part, said male part and said female part being at least in part of relatively flexible material, said male part having a stem and an enlarged pointed head at its forward end, said pointed head having a re-entrant conical shoulder at its connection to said stem, said head and stem being adapted to be inserted through an animal's ear, said female part including an eyelet having a conical bearing surface tapering to a front end and complementary to the conical shoulder on said male part, a rigid cap extending around said eyelet protruding to the front of said female part and defining an enclosure, said head being adapted to be inserted through said eyelet and received inside said enclosure defined by said cap, said conical bearing surface being adapted to cooperate with said conical shoulder to lock said male part in place in said female part subsequent to insertion, said cap being made of material harder than that of said eyelet, said cap having an open annular base encircling said eyelet in the vicinity of and rearwardly and radially outwardly of said conical bearing surface relative to the front end of said conical bearing surface, said base defining a rigid reinforcement of said eyelet for preventing rearward withdrawal of the male part, said cap being permanently fixed to said female part at said base, the angle of taper of said conical bearing surface being about 45°.

4,597,209

CHANGEABLE DISPLAY DEVICE

Marlin E. Hukill, P.O. Box 466, Seymour, Ind. 47274

Filed Aug. 26, 1983, Ser. No. 526,656
Int. Cl.⁴ G09F *3/04*
U.S. Cl. 40—447 **17 Claims**



1. A changeable display device comprising:

a support member;

a plurality of display elements, each of said display elements having a first display side and a second display side and an attaching edge, said attaching edge being pivotally mounted to said support member so that said display element is pivotable into a first display orientation and a second display orientation whereby said first display orientation corresponds to the displaying of said first display side and said second display orientation corresponds to the displaying of said second display side;

a camming member connected to said display element adjacent said attaching edge;

spring means connected to said support member adjacent said camming member for exerting a force against said camming member to urge the pivoting of said display element into said first or into said second display orientations and to restrain the pivoting of said display element out of said first or said second display orientations;

said camming member has a camming surface portion and a body portion and said body portion being connected to said display element adjacent said attaching edge so that said camming surface portion is disposed away from the axis of pivoting of said display element and so that said spring means engages said camming surface portion and exerts said force against said camming surface portion; and

said camming surface portion has a first surface elbow portion and an opposite second surface elbow portion whereby said camming member is urged to pivot into said first display orientation and restrained from pivoting out

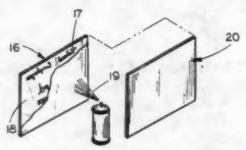
of said first display orientation when said force is exerted by said spring means engaging said camming surface portion at said first elbow surface portion and said camming member is urged to pivot into said second display orientation and restrained from pivoting out of said second display orientation when said force is exerted by said spring means engaging said camming surface portion at said second elbow surface portion.

4,597,210

DECORATIVE ITEM AND METHOD OF MAKING THE SAME

John V. Kitrell, 4639 Holdrege, Lincoln, Nebr. 68503

Filed Apr. 23, 1984, Ser. No. 603,090
Int. Cl.[4] G09F *13/20*
U.S. Cl. 40—542 **3 Claims**



1. The method of reproducing material and producing a decorative item containing that reproduced material, comprising the steps of:

making a master copy of the material to be reproduced and which will appear on the item,

making a photocopy transparency of the master copy by a photocopy machine so that the reproduced material is positioned on the back side of the transparency,

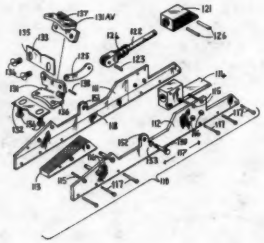
and painting the back side of the transparency so that a colored background is created for the reproduced material.

4,597,211

SELF-ALTERNATING REAR SIGHTS FOR DOUBLE-BARREL FIREARMS

Paul S. Miles, 5/61 Vanberg Road, Essendon, Victoria 3040, Australia

Filed Aug. 15, 1983, Ser. No. 523,331
Int. Cl.[4] F41G *1/16*
U.S. Cl. 42—1 S **16 Claims**



1. Self-alternating sights for firearms such sights comprising;

a. An aiming means with two interchanging sight setting means, each of which is alignable with a separate point of projectile impact, at a selected distance,

b. An alternating means which when set, automatically and instantly interchanges the said sight setting means when a shot is fired from a firearm on which said sights are mounted,

c. A resetting means to return the alternated aiming means to its set position,

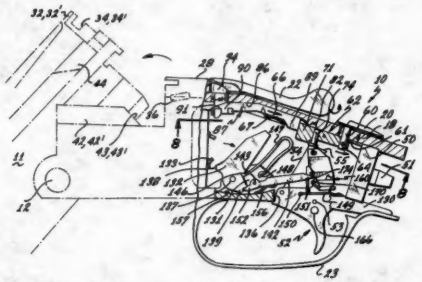
d. A means for housing the said aiming, alternating and resetting means for attaching the said sights to said firearm.

4,597,212

SAFETY DEVICE FOR GUNS

Fred Jennie, Corona del Mar, Calif., assignor to Weatherby, Inc., South Gate, Calif.

Filed Aug. 1, 1983, Ser. No. 519,077
Int. Cl.[4] F41C *17/02*
U.S. Cl. 42—70 E **8 Claims**



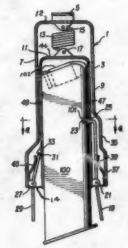
1. In a firearm having a breech which can be opened and closed, the gun having a trigger means and having a safety mechanism including a trigger block which is positionalbe into a firing position into a safety position, the gun having lever means for unlocking and locking the breech in a closed position, the improvement comprising a linkage extending between said lever means and said trigger block whereby when the lever means is out of the closed and locked position of the breech, said trigger block is moved out of the said firing position and into a position wherein actuation of the trigger for firing is prevented, said trigger block having means movable to cooperate with a fixed part of the firearm to allow firing when said block is in said firing position.

4,597,213

MAGAZINE CARRIER FOR USE ON FIREARMS OR OTHER SUPPORT

Daniel D. Musgrave, 8201 Caraway St., Cabin John, Md. 20818

Filed Dec. 18, 1984, Ser. No. 682,944
Int. Cl.[4] F41C *27/00*
U.S. Cl. 42—90 **18 Claims**



1. A carrier for a cartridge magazine, said carrier comprising: a housing; means for attaching said housing to a supporting structure; magazine engagement means slideable within said housing; releaseable latch means on said magazine engagement means, said latch means positionally adapted for retaining said magazine within said magazine engagement means; and bias

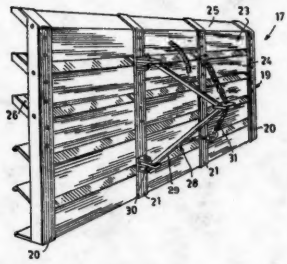
means urging said magazine engagement means toward a first position within said housing whereat blocking means prevents release of said latch means.

4,597,214

TRAWLING APPARATUS

Clifford W. Collins, Unit 1, Sherbrook Court, 8 Morley Street, West Tweed Heads, New South Wales 2485, Australia

Filed Nov. 8, 1984, Ser. No. 669,296
Claims priority, application Australia, Nov. 11, 1983, PG2350
Int. Cl.[4] A01K *73/04*
U.S. Cl. 43—9 8 Claims



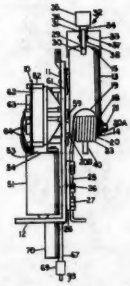
1. Trawling apparatus attachable to a trawling net including:
a frame:
first attachment means on the frame for connection to a tow line;
second attachment means on the frame for connection to the net;
a plurality of spaced slats extending laterally or longitudinally relative to the frame, each slat having a substantially vertical front portion and an inclined trailing portion, said vertical front portion extending downwardly from a leading edge of said inclined trailing portion to form an extended vertical length to each said slat; and
flow passages defined between the slats, wherein:
at least one of the trailing portions is upwardly inclined to generate a downward force on the apparatus.

4,597,215

POWERED JIGGING DEVICE

Harvey E. Otremba, Box 251, Sequim, Wash. 98382

Continuation-in-part of Ser. No. 508,844, Jun. 29, 1983, abandoned. This application May 23, 1984, Ser. No. 613,298
Int. Cl.[4] A01K *97/10*
U.S. Cl. 43—19.2 13 Claims



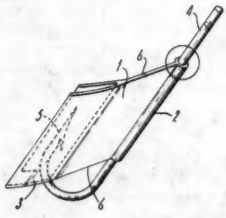
5. An improved jigging device for oscillating a fish pole at variable frequencies of translatory motion operated in combination with a system of a motor, gear train, variable time delay control unit and power source, wherein the improvement comprises:
an L-shaped, upright structure combining an elongated rectangular plate at a lesser side edge to an equivalent side edge of a shorter plate,
a rotatable fish pole holder comprising an open ended tube elastically mounted at a rear end to the elongated plate and adapted to receive within a front end the reel end of the fish pole,
means for preventing said fish pole from turning sideways in the holder comprising a pivotal, counter-balancing member mounted on said front end of said holder, the member having an opening for slipping over the reel end of said pole and exerting pressure thereon,
a gear box enclosing a gear train mounted on the other side of said elongated plate the gear train being adapted to drive a revolving shaft having an end extending through an opening in said plate,
means for engaging and oscillating said holder in translatory motion, said holder becoming a follower to an adjcent cam disk and offset linkage connected to the end of the revolving shaft,
a two speed motor mounted on the gear box having a drive shaft extending therein to a rotatable connection with the gear train,
a variable time delay control unit connected to an electric cable having leads removably connected to an electrical plug adapted to operate said gear box and the motor, the other end of the cable being removably connected to a battery, and
a box-like housing for enclosing the jigging device including a top side having a slotted opening for access and movement of a portion of the front end of said holder outside of the housing, a front and rear side and an open bottom for slipping over said device.

4,597,216

FISH HOOK PROTECTOR

Kolbjörn Björshol, N-6560, Langöyneset, Norway

PCT No. PCT/NO83/00051, § 371 Date Jul. 9, 1984, § 102(e) Date Jul. 9, 1984, PCT Pub. No. WO84/02057, PCT Pub. Date Jun. 7, 1984
PCT Filed Nov. 18, 1983, Ser. No. 629,835
Claims priority, application Norway, Nov. 22, 1982, 823898
Int. Cl.[4] A01K *97/06*
U.S. Cl. 43—43.2 5 Claims



1. A fish hook protector for use with a fish hook which includes a leg portion and a curved point portion, said fish hook protector comprising
a plate-like center part which has two opposite side edges which are parallel to one another,
an elongated gripping part which extends along a first of said two opposite sides of said center part, said elongated gripping part including an elongated channel therein for receiving the leg portion of a fish hook, and
an elongated shielding part which extends along a second of said two opposite sides of said center part, said elongated shielding part including an elongated channel therein for receiving and covering at least the sides of the curved point portion of a fish hook whose leg portion is received in said elongated gripping part, the elongated channel in

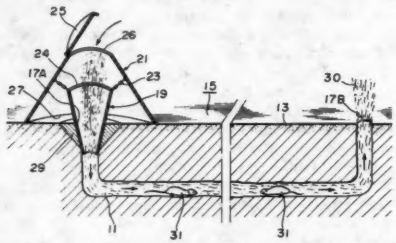
said elongated shielding part extending in parallel with the elongated channel in said elongated gripping part.

4,597,217

METHOD OF KILLING FIELD MICE AND THE LIKE AND APPARATUS FOR PRACTICING THE METHOD

Haruyoshi Narita, Tokyo, Japan, assignor to Nihon Sanso Kabushiki Kaisha and Shoji Kabushiki Kaisha, both of, Japan

Filed Feb. 27, 1984, Ser. No. 583,942
Int. Cl.[4] A01M *13/00, 17/00*
U.S. Cl. 43—125 3 Claims



1. A method of killing a field mouse comprising the steps of:

(a) introducing liquid nitrogen in an amount sufficient to suffocate the field mouse to death into one of the openings of a burrow formed in the ground; and

(b) evaporating the introduced liquid nitrogen to thereby fill the burrow with the evaporated nitrogen and cause the evaporated nitrogen to issue from the other openings by expansion of the evaporated nitrogen, whereby the field mouse in the burrow is suffocated to death.

3. An apparatus for killing a field mouse comprising:

(a) a funnel member having two ends with one end having a smaller diameter than the other end and which is adapted to be fitted into the opening of a field mouse burrow, said funnel being used to introduce liquid nitrogen into said burrow,

(b) means for sealing the other end of the funnel member from the atmosphere, said sealing means comprising:

(i) an enclosure member having two open ends for enclosing the funnel member; and

(ii) a closure member for sealing one open end of the enclosure member, wherein the funnel member is connected to the enclosure member so that the funnel member is centrally positioned within the enclosure member with the smaller diameter end of the funnel member disposed at a position remote from the one open end of the enclosure member.

4,597,218

SACHET FOR USE IN PEST CONTROL

Wolfgang Friemel, Heppenheim, and Reiner Ehret, Weinheim, both of Fed. Rep. of Germany, assignors to Dr. Werner Freyberg, Laudenbach, Fed. Rep. of Germany

Filed Jul. 16, 1984, Ser. No. 631,139
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1983, 3325826
Int. Cl.[4] A01M *13/00*
U.S. Cl. 43—131 44 Claims

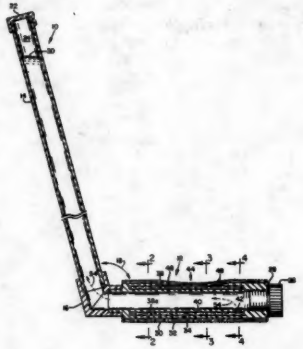
1. A sachet for pest control, composed at least in part of a gas-permeable and water vapor-permeable substantially anhydrous non-woven fabric, said fabric being a plural component non-woven fabric comprising at least one material forming fibers and having a melting or softening temperature above 165° C. and a second material having thermoplastic properties and a melting or softening temperature below 145° C. and containing enclosed thereby a pest control agent adapted to release a pesticidal gas when the sachet is exposed to ambient atmosphere.

4,597,219

VACUUM/GRAVITY FEED CONTACT HERBICIDE APPLICATOR

Walter K. Kropf, Harrisburg, Oreg., assignor to Lee A. Smucker, Harrisburg, Oreg.

Filed Aug. 2, 1984, Ser. No. 637,116
Int. Cl.[4] A01M *21/00*
U.S. Cl. 47—1.5 17 Claims



1. An apparatus for contact application of liquid herbicide comprising:

a wiper head comprising an enclosed vessel;

a source of herbicide liquid;

means defining a generally vertical conduit for liquid to flow from the source into a lower portion of the vessel;

means defining a passageway in communication with the conduit at the lower portion of the vessel and extending generally vertically from the lower portion of the vessel to an outside outlet opening along an upper side of the vessel;

a first wicking means comprising a non-woven, fibrous synthetic chamois material wrapped at least partially around a portion of the vessel including the upper side thereof for contact application of the liquid from the vessel to vegetation;

the source being elevated above the wiper head so as to create a head of pressure such that liquid is gravity fed to the wiper head and being closed to the atmosphere and of a predetermined volume so as to apply a partial vacuum to the liquid to provide a reduced pressure of the liquid at the wiper head such that a liquid level in the passageway is limited to a level spaced below the outlet opening; and

second wicking means disposed in the passageway for conducting an amount of said liquid upwardly from said level to said outlet for transfer to the first wicking means.

4,597,220

CLOSED ENCLOSURE USED AS GREENHOUSE, CULTIVATION FRAME OR FISH POND AND IMPROVING EXPLOITATION CONDITIONS

Andre R. J. Bourrié, Mantes La Jolie, and Jacques L. R. Maroselli, Luxeuil Les Bains, both of France, assignors to Andre Bourrie and Jacques Maroselli, both of Mantes La Jolie, France

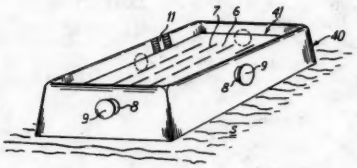
Filed Mar. 21, 1984, Ser. No. 591,794
Claims priority, application France, Mar. 22, 1983, 83 04648
Int. Cl.[4] A01G *9/24*
U.S. Cl. 47—27 13 Claims

1. An enclosure, comprising:

at least one cover having edge means along the periphery of at least one central recessed substantially flat upper portion, said edge means having inner side walls facing the central flat portion, and outer side walls facing away from

the central flat portion, said outer side walls being provided with holes, said recessed substantially flat portion including a plurality of calibrated and regularly spaced slits for admitting a penetration of liquid at a predetermined rate into the enclosure, and

plugs having an axis and a diameter so as to sealably engage within each of said holes, each of said plugs being longitudinally translatably insertable in a respective one of said holes and including longitudinally extended radial slot means, said slot means communicating the interior of said enclosure with the exterior of the enclosure when the plug



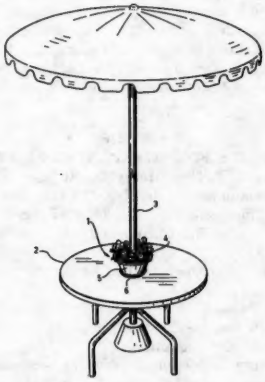
is pulled outwardly, along its axis, relative to the interior of said enclosure, each of said plugs and said cover cooperating to define means for admitting a quantity of air under said cover when the edge means of said cover are placed on a flat surface, said radial slot means in each of said plugs defining means for regulating the quantity of air admitted as each of said plugs is translated axially relative to its respective hole and means limiting the extension of said plug within the respective hole to prevent accidental removal of said plug in either direction along the axis of the plug.

4,597,221

PLANT RECEPTACLE

Brenda A. Adair, and Kent A. Stevens, both of Ontario, Canada, assignors to Creative Planters Inc., Port Hope, Canada

Filed Mar. 26, 1984, Ser. No. 593,056
Int. Cl.[4] A01G *9/02*
U.S. Cl. 47—66 **8 Claims**



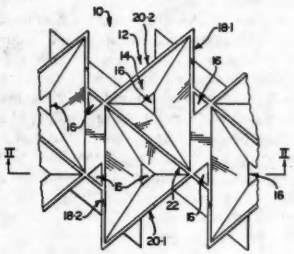
1. A plant receptacle for use with an umbrella-type table having a generally horizontal table top and an umbrella mounted to an umbrella supporting member extending generally vertically through an aperture located in said table top, the receptacle comprising a first, outer container, a second, inner container and a central sleeve, said first container being generally saucer shaped and having a side wall and a bottom wall, the bottom wall of said first container having central aperture dimensioned to permit said umbrella supporting member to extend through said aperture, said sleeve extending upwardly from and being contiguous to the bottom wall of said first container, so that water and soil do not leak out of said receptacle between said sleeve and said first container, and said sleeve also being open at both ends and being internally dimensioned to permit said umbrella supporting member to extend through said sleeve, and said second container being adapted to be positioned upon and within said first container and being generally bowl shaped and having a side wall and a bottom wall, the bottom wall of said second container having a central aperture dimensioned to permit said sleeve to extend through said aperture, said second container also having drainage means so that said plant receptacle permits drainage of water from said second container to said first container but prevents leakage of water or soil through said central aperture in the bottom wall of said first container, said sleeve being of height proximate that of the side wall of said second container so that when said first and second containers and said sleeve are positioned concentrically, said second container and said sleeve define an upwardly facing annular cavity of sufficient volume for locating earth and implanting flowers and the like.

4,597,222

SEEDLING TRAY

Hermanus B. Roode, 510 Jonathan Str., Waterkloof Glen, Transvaal Province, South Africa

Filed Sep. 27, 1984, Ser. No. 655,503
Int. Cl.[4] A01G *9/02*
U.S. Cl. 47—87 **5 Claims**



1. A seedling tray having spaced parallel opposed faces, and which has a multiple of intercalating seedling cavities of generally triangular section arranged in successive rows across the tray, the cavities of adjacent rows tapering oppositely from large triangular-shaped mouth openings in both of the said opposed faces of the tray to small triangular-shaped bottom openings for the cavities in the said opposed faces, thereby rendering the tray reversible, and in which the cavities are arranged in such a way that when two successive rows are seen in side elevation, a side wall of a cavity which converges away from one of the said faces overhangs an adjacent cavity in the adjacent row the said adjacent cavity converging away from the other of the said faces.

4,597,223

DOOR WINDOW REGULATOR

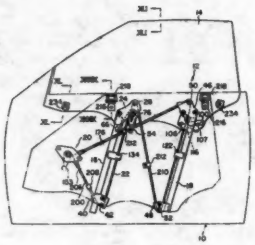
Daiichi Shiraishi; Eiji Iwasaki, and Ryoichi Fukumoto, all of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Aisin Seiki Co., Ltd., both of, Japan

Filed Jun. 5, 1985, Ser. No. 741,441
Claims priority, application Japan, Jun. 6, 1984, 59-83810[U]; Jun. 6, 1984, 59-83811[U]; Jun. 6, 1984, 59-83812[U]
Int. Cl.[4] E05F *11/48*
U.S. Cl. 49—352 **32 Claims**

1. A door window regulator for vertically moving a door window glass of a vehicle, comprising:

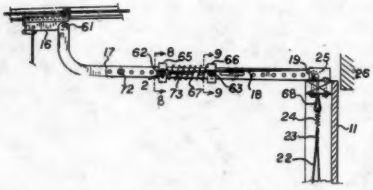
(a) a pair of parallel guide members secured to a door;

(b) sliders secured to the lower portion of said door window glass and guided by the respective guide members;
(c) upper and lower pulleys rotatably supported at the respective upper and lower portions of each of said guide members;
(d) a wire stretched between said upper and lower pulleys on each of said guide members, said wire being further stretched between the upper pulley on one of said guide members and the lower pulley on the other guide member and between the lower pulley on said one guide member and the upper pulley on said other guide member so that said wire forms a closed loop;



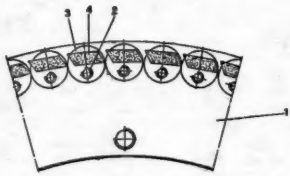
(e) a driving unit adapted to actuate a portion of said closed loop wire; and
(f) a pair of glass brackets provided such as to respectively correspond to said guide members and secured to said window glass to retain the respective sliders, each of said glass brackets having a holder which retains the portion of said wire extending between said upper and lower pulleys on each of said guide members, said holder of at least one of said glass brackets being permitted to move relative to the associated glass bracket so that said holder is employed to adjust the position of said window glass in the direction of its pivotal movement within the plane of the surface thereof.

4,597,224
AUTOMATIC GARAGE DOOR OPENER
Derry E. Tucker, 69 Davidson St., Chula Vista, Calif. 92010
Filed Feb. 2, 1984, Ser. No. 576,211
Int. Cl.[4] E05F *11/00*
U.S. Cl. 49—199 **5 Claims**



1. In an automatic door opener system including a track for movement of a motorized carriage, an improved connection between the carriage and door including a mechanical latching and delay device comprising:
a. a first rigid element linked to the carriage;
b. a second rigid element linked to the door;
c. connecting means between the two linkage elements allowing for a short range of movement relative to each other;
d. biasing means between the first and second rigid elements;
e. latching means mounted on the door and biased to the closed position; and
f. latch acutating means connected to said first rigid element such that travel of said first element will actuate the latch before overcoming the bias and applying tension to said second linkage element to raise the door.

4,597,225
INTERCHANGEABLE SUPPORT DISC FOR DIAMOND-BEARING PLATES OF CIRCULAR MILLING CUTTERS
Marcello Toncelli, Via Giovanni XXIII, Bassano Del Grappa (Vicenza), Italy
Continuation of Ser. No. 551,684, Nov. 14, 1983, abandoned. This application Jul. 1, 1985, Ser. No. 750,547
Claims priority, application Italy, Nov. 22, 1982, 6444582[U]
Int. Cl.[4] B24B *7/10*
U.S. Cl. 51—209 R **1 Claim**



1. A circular milling cutter for stone, marble, granite and the like, which comprises:
(a) a circular support member for rotating about a center and (1) having an annular array of circular recesses (5);
(b) a circular disc (3) mounted on said circular support rotatable member (1) in each said recess (5);
(c) a screw (2) which connects each said discs to said circular support rotating member; said screw passing perpendicularly to the plane of each of said discs;
(d) a diamond bearing plate (4) mounted on each of said discs (3), said plate being of parallelopipedal shape, wherein said screw is located closer to the center of said circular support rotating member (1) than said diamond-bearing plate, said screw being located eccentrically with respect to the center of each of said discs (3), and said diamond-bearing plate being welded to said disc.

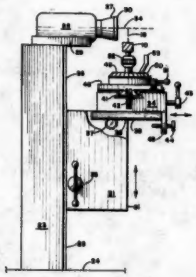
4,597,226
APPARATUS FOR SHARPENING END MILLS
Bryce D. Jewett, Sr., 2901 Maury St., Richmond, Va. 23224
Continuation-in-part of Ser. No. 519,811, Aug. 2, 1983, abandoned. This application Jan. 14, 1985, Ser. No. 691,212
Int. Cl.[4] B24B *3/04*
U.S. Cl. 51—92 ND **5 Claims**

1. Apparatus for sharpening the face cutting edges of an end mill comprising:
(a) a vertical stand,
(b) a rotatable abrasive wheel mounted to said stand and having a circular periphery,
(c) a first platform which engages a lower portion of said stand in a manner to be positionable thereupon at precisely determined elevations,
(d) a second platform mounted atop said first platform in a manner to be movable in a first lateral direction of displacement to and from said stand, and associated means to limit the extent of displacement in said first lateral direction,
(e) a third platform mounted atop said second platform in a manner to be movable in a second lateral direction of displacement perpendicularly disposed to said first lateral direction of displacement, and means associated with said

third platform for limiting the extent of movement in said second lateral direction,

(f) said third platform having an upper surface which is downwardly sloped toward said vertical stand, thereby presenting a tilted effect wherein the extremity of said third platform closest said stand is at a lower elevation than its diametrically opposed extremity,

(g) a turret rotatably positioned atop said third platform, said turret having a scale of angular markings and provided with means for locking the position of the turret at a desired marking,



(h) holding means centered in said turret and adapted to hold an end mill in a manner such that, in the course of movement of the end mill in said first lateral direction of displacement toward the abrasive wheel, the face cutting edge of the end mill will contact the circular periphery of said abrasive wheel in a manner such that said circular periphery is substantially perpendicularly disposed to said cutting edge, and

(i) elongated alignment means extending upwardly from said turret to orient face cutting edges to markings on said turret.

4,597,227

DEVICE FOR ATTACHING A TOOL

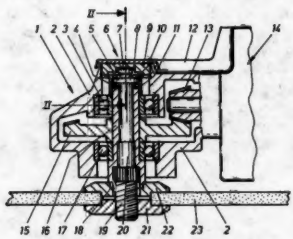
Josef Gentischer, Weinstadt, and Boris Rudolf, Stuttgart, both of Fed. Rep. of Germany, assignors to C. & E. Fein GmbH & Co., Stuttgart, Fed. Rep. of Germany

Filed Dec. 10, 1984, Ser. No. 680,194

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1984, 3405885; Apr. 14, 1984, 3414148; Aug. 30, 1984, 3431901

Int. Cl.[4] B24B *23/02*

U.S. Cl. 51—168 **22 Claims**



1. Apparatus for attaching a tool in portable angled grinders comprising a motor; angular drive means, and a securing station for the tool; said angular drive means comprising a pinion, a beveled cogwheel, and a hollow driveshaft having an axis; a spindle positioned in said driveshaft; housing means for housing said drive means; displacing means, said spindle being positioned in said driveshaft so that it cannot rotate but can be displaced axially from outside said housing means by said displacing means; activating means in said displacing means; traveling means and a terminal component, said spindle having an appendage; resilient means between a face of said driveshaft and said appendage on said spindle, said activating means in said displacing means acting through said traveling means at an angle to the axis of said driveshaft on said terminal component against a force of said resilinet means; said driveshaft having a threaded pin; a nut screwed onto said threaded pin; a bushing-shaped cover on said driveshaft for limiting travel so that said nut screwed onto said threaded pin on said driveshaft is lifted away from the tool.

4,597,228

VACUUM SUCTION DEVICE

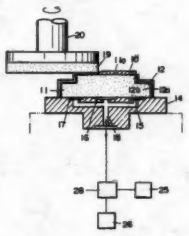
Isao Koyama, and Toshikazu Hatsuse, both of Tokyo, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1984, Ser. No. 671,676

Claims priority, application Japan, Dec. 19, 1983, 58-195273[U]

Int. Cl.[4] B24B *47/00*

U.S. Cl. 51—235 **3 Claims**



1. A vaccum suction device comprising:

a vacuum suction plate formed by baking a porous material and having a flat suctin face for holding a workpiece by suction;

a base abutting on a bottom of said vaccum suction plate for supporting said vacuum suction plate and having a plurality of suction grooves in a part of the surface abutting on the bottom of said suction plate, said suction grooves being coupled to a pipe of said base;

an intake device coupled to the pipe of said base; and

a peripheral member formed of an airtight material for encircling said suction plate, said peripheral member being formed by coating a mixture made by mixing a bonding agent and an inorganic material having a grain size large enough to block pores of said suction plate and similar to said porous material forming said suction plate in physical properties and a part of the peripheral member overlapping with the lower peripheral surface of the workpiece, thereby preventing a grinding liquid from splashing onto said suction plate and preventing a reduction in suction force applied by said intake device acting on said workpiece;

4,597,229

PRESSURE RELIEF WALL ASSEMBLY

Joseph M. Minialoff, 25 Edgehill Rd., Islington, Ontario, Canada (M9A 4N1); Gerrard O. Minialoff, Kleinberg, and Thomas C. McCavour, Islington, both of Canada, assignors to Joseph M. Minialoff, Toronto, Canada

Filed Jun. 4, 1984, Ser. No. 617,043

Claims priority, application Canada, Jun. 20, 1983, 430751

Int. Cl.[4] E04H *9/00*

U.S. Cl. 52—1 **14 Claims**

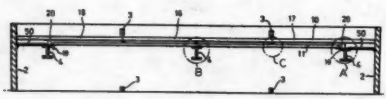
1. A pressure relief wall assembly for mounting on a frame comprising a first central support, and two second supports

located on either side of the first support, the pressure relief wall assembly comprising:

a liner panel having first and second end portions, and being secured at a central portion thereof to the first, central support;

respective first fastening means for end portions of the liner panel, each of which first fastening means releasably fastens one respective end portion of the liner panel to a corresponding second support, which first fastening means in use fail when a predetermined excess pressure is applied to either side of the wall assembly;

a first exterior panel, which is secured at a central portions thereof to the first, central support, and which includes first and second end portions, with the first end portion secured to the liner panel between the first end and central portions thereof, and with the second end portion of the first exterior panel secured to the liner panel between the second end and central portions thereof;



two second exterior panels, each of which is secured to a respective second support and includes a respective free end portion;

two second fastening means, each of which releasably fastens said respective free end portion of a respective second exterior panel to one of the liner panel and a respective end portion of the first exterior panel, which second fastening means fail in use when a predetermined excess pressure is applied to either side of the wall assembly;

wherein in the liner and exterior panels and the fastening means are substantially symmetrical about the first, central support;

whereby, in use, in response to an excess pressure applied to either side of the wall assembly, the liner panel and the first exterior panel are released from the second support and the second exterior panel, and deflect symmetrically about the first, central support, and the second exterior panels deflect around the second supports.

4,597,230

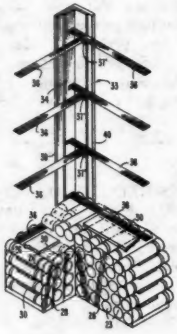
LOG CONSTRUCTION DEVICE

Donald J. Klocke, 13636 Hamilton Dr. #104, Fountain Hills, Ariz. 85268

Filed Apr. 24, 1984, Ser. No. 603,307

Int. Cl.[4] E04B *1/10*

U.S. Cl. 52—233 **2 Claims**



1. An end log construction apparatus comprising a plurality of logs arranged in horizontal rows one above the other with the ends of logs laterally of the length of the rows, and with the rows arranged in two stacks to form two walls perpendicular to one another and intersecting one another to form a corner, a pair of vertically elongated flanges perpendicular to one another laterally of their length and extending upward in length along the outside of the logs where the logs intersect to form said corner, flexible strips with their one ends fixed to the elongated flanges at vertically spaced intervals and with their other ends extending outward along the two walls horizontally between the horizontal rows of logs at vertical intervals, insulation material mounted between the logs intermediate the inner and outer ends of the logs, masonry material mounted along the inner and outer ends of the logs to form the inner and outer surfaces of the walls adjacent the logs.

4,597,231

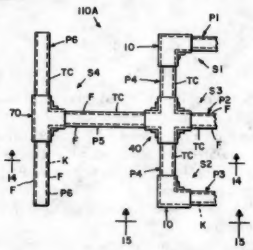
ANGULAR CAP FOR DRESSING AND STABILIZING OFFICE PARTITIONING

Thomas A. Quest, 9205 Timberline Dr., Omaha, Nebr. 68152

Filed Oct. 22, 1984, Ser. No. 663,409

Int. Cl.[4] E04B *2/76, 2/74*

U.S. Cl. 52—239 **10 Claims**



1. For use within an office environment comprising horizontal office-flooring and office-ceiling and both being at least partially bounded by vertically extending ceiling-height office-walls, said office environment further including less than ceiling-height partitioning comprising individual upright partitions angularly meeting at partitioning meeting stations located remote of said office-walls and respective partitions having a linearly extending horizontal base-edge and a linearly extending horizontal top-edge, individual partitions having a pair of substantially parallel upright-faces depending from said top-edge and partitions extending vertically of said office-flooring whereby the top-edges overly the base-edges, each of said partitioning meeting stations including at least two horizontally extending top-edges of different vertical partitions meeting in approximately vertically abutting relationship but including at least one transversely extending intervening discontinuity thereat whereby, because of said loftily positioned discontinuity between meeting partitions, said partitioning upper portion has a non-aesthetic appearance and has lesser stability toward transversely extending forces than along respective base-edges, an angular cap for for aesthetically dressing and stabilizing said office partitioning at the transversely extending discontinuity between meeting top-edges of individual partitions, said angular cap comprising:

(a) a horizontal roof-plate adaped to be superimposed along partitions top-edges and the intervening discontinuity of a partitioning meeting station, said roof-plate including at least two wings and all of which merge together at a roof-plate central-part adapted to be superimposed upon said transversely extending discontinuity, each wing having three linearly extending prominent wing-edges including a primary-edge located most remote from the roof-plate central-part and including two substantially parallel secondary-edges;

(b) a plurality of stiff vertical-plates respectively confined to and extending integrally downwardly from the respective

roof-plate secondary-edges, each vertical-plate including an inner-face located on the inner-side of the angular cap and an outer-face located on the outer-side of the angular cap, two vertical-plates from neighboring roof-plate wings defining a right-angled corner, and the vertical-plates of the same roof-plate wing being adapted to snugly abut both upright-faces of an individual partition at a said partitioning meeting station; and

(c) said roof-plate and all said vertical-plates being provided from a single patterned-piece of metallic sheet material having a sliver-like cutaway portion for each said right-angled corner, and the angular cap outer-side at each said right-angled corner carrying a dual-trapezoidal gusset-plate reinforcement attached to the outer-face of both vertical-plates thereat and in non-interfering relationship to the two inner-faces of each said right-angled corner.

4,597,232

CURVED CORNER OF A SPACER FRAME OF AN INSULATING GLAZING, AND A PROCESS FOR THE PRODUCTION THEREOF

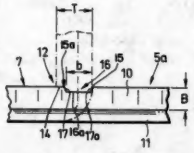
Horst Lingemann, Wuppertal, Fed. Rep. of Germany, assignor to Helmut Lingemann GmbH & Co., Fed. Rep. of Germany

Filed Jul. 13, 1984, Ser. No. 630,749

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1983, 3325718

Int. Cl.[4] E06B *3/24*

U.S. Cl. 52—304 **7 Claims**



1. A spacer frame of an insulating glazing comprising:

said spacer frame being constructed from a hollow-profile construction having an inside wall, side walls and an outer wall, said walls having a predetermined wall thickness;

said spacer frame having at least one curved corner;

cut-out means disposed in a corner zone of said curved corner to include an opening through said inside wall and into a width of each side wall to provide a rectangular aperture in said inside wall and a U-shaped aperture in each side wall prior to forming the curved corner;

a first portion of said inside wall having a first free transverse edge disposed at said rectangular aperture, and a second portion of said inside wall having a second free transverse edge disposed at said rectangular aperture, said first and second free transverse edges being parallel to each other and being spaced apart by a first preselected length across said rectangular aperture;

said first portion of said inside wall extending at a right angle to said second portion of said inside wall, and said outer wall being curved to provide said curved corner;

said second portion of said inside wall including a free end portion extending a second preselected length from said second free transverse edge to a transverse segment of said second portion;

said first free transverse edge on said first portion clamping over onto said transverse segment of said second portion to provide said corner zone, with said free end portion of said second portion being disposed within a hollow interior of said curved corner;

each side wall having a base edge and first and second side edges disposed at its associated U-shaped aperture, said first and second side edges of each side wall being angularly disp ed with respect to their associated base edge with said first and second side edges of each side wall diverging away from each other from their associated base edge toward said first and second free transverse edges of said inside wall respectively;

each of said first and second side edges having a depth length from said inside wall to their associated base edge which is deeper than said wall thickness of said hollow-profile construction; and

said first side edge of each side wall being disposed on said free end portion of said second portion, and said base edge of each side wall being bent onto itself.

4,597,233

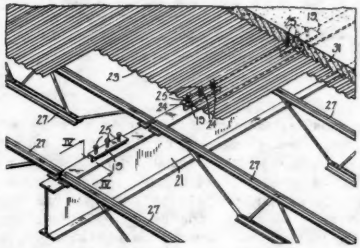
GIRDER SYSTEM

James Rongoe, Jr., 52 Strawberry Hill Ct., Stamford, Conn. 06902

Filed Mar. 5, 1984, Ser. No. 586,418

Int. Cl.[4] E04B *1/16*

U.S. Cl. 52—334 **9 Claims**



1. In a framed concrete slab structure comprising at least one elevated girder having an upper surface, at least one elevated joist intersecting said at least one girder along the upper surface of said at least one girder, and deck means disposed to rest on said joist and adapted to receive poured concrete thereon, the improvement comprising:

shear connector mounting means mounted to said upper surface of said at least one girder and spaced away and separate from said joist, said shear connector mounting means projecting upwardly from said upper surface of said at least one girder, and

a shear connector mounted to said shear connector mounting means and projecting upwardly therefrom, said shear connector having an upper portion thereof extending through an opening defined in said deck means so that said upper portion of said shear connector is adapted to be embedded in said poured concrete on said deck means.

4,597,234

STANDING SEAM ROOF ASSEMBLY

Harold G. Simpson, Oklahoma City, Okla., assignor to Harold Simpson, Inc., Oklahoma City, Okla.

Continuation-in-part of Ser. No. 481,844, Apr. 4, 1983, Ser. No. 428,568, Sep. 30, 1982, Ser. No. 428,459, Sep. 30, 1982, Pat. No. 4,503,653, Ser. No. 378,241, May 14, 1982, Pat. No. 4,528,789, and Ser. No. 326,144, Nov. 30, 1981, Pat. No. 4,472,920. This application Jan. 4, 1984, Ser. No. 568,083

Int. Cl.[4] E04B *5/52*

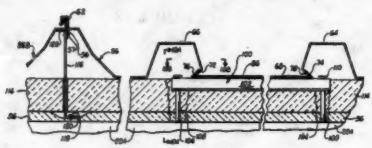
U.S. Cl. 52—478 **24 Claims**

1. In a standing seam roof assembly in which roof panels are supported by underlying structure in side by side contiguous relationship with interlocking side lap joint portions, an improved female/male interlock seam assembly formed by the interlocking engagement of contiguous roof panels wherein each roof panel comprises:

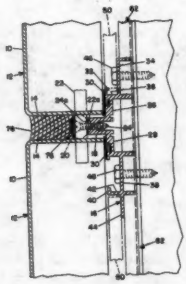
a first female side lap joint along one side of the roof panel having a first leg portion extending substantially normal to

the medial panel portion and a second leg portion angularly extensive from the first leg portion and forming an insertion cavity therebetween, an upper portion of the insertion cavity providing a mastic cavity portion, the second leg portion forming a shoulder stop in the medial portion thereof and forming an edge engaging ramp portion extending generally toward the first leg portion to partially block the opening of the insertion cavity; and

a second male side lap joint along the other side of the roof panel and having a first leg portion extending substantially normal to the medial panel portion and a second leg portion angularly extensive from the first leg portion and forming a male apex portion at the junction of the first and second leg portions, the end of the second leg portion defining a ramp engaging edge and having a shoulder engaging portion formed therein at a predetermined distance from said ramp engaging edge, the second male side lap joint matingly receivable by a female side lap joint of identical construction to the first female side lap joint formed along the side of a contiguously disposed roof panel, the second male side lap joint insertable into the insertion cavity of said contiguous first female side lap joint so that the male apex extends into the mastic cavity portion, the first leg portion of the second male side lap joint being substantially parallel to the first leg porion of the female side lap joint, in the assembled position, and the shoulder engaging portion and the ramp engaging edge of the second leg portion of the second male side lap joint abuttingly engaging respectively the shoulder stop portion and the edge engaging ramp of the female side lap joint to which it is interlocked so that the male apex of the second male side lap joint is fixedly secured thereby at a predetermined position within the mastic cavity portion.

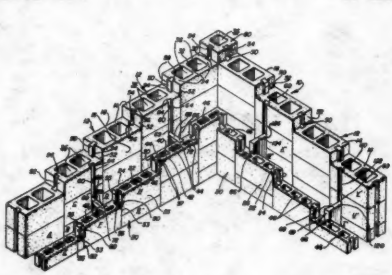


4,597,235
PANEL WALL SYSTEM
Robert W. Olsen, New Providence, N.J., assignor to Construction Specialties, Inc., Cranford, N.J.
Filed Nov. 8, 1984, Ser. No. 669,585
The portion of the term of this patent subsequent to Mar. 26, 2002, has been disclaimed.
Int. Cl.[4] E04B *1/38*
U.S. Cl. 52—509 **6 Claims**



1. An exterior panel wall assembly comprising a multiplicity of rectangular panels arranged in closely spaced relation side by side and end to end, each panel being of pan-like shape and consisting of a principal wall forming a portion of an exterior building wall and a continuous peripheral flange extending from the principal wall toward the building structure, a horizontal retainer fastened to the building structure and coextensive with the horizontal juncture between each pair of vertically adjacent panels, fastening means joining each horizontally extending flange of each pair of vertically adjacent panels to the corresponding horizontal retainer, and a drainage channel member located at the vertical juncture between each pair of horizontally adjacent panels, each drainage channel member being coextensive with the vertical portions of the peripheral flanges of the respective panels at said vertical juncture and having a base portion and flanges along each edge of the base portion extending away from the building structure toward the panels and spaced-apart laterally outwardly of the vertical portions of the peripheral flanges of said horizontally adjacent pair of panels relative to the vertical juncture between them, and each horizontal retainer having a drainage trough extending coextensively with the horizontal juncture between said pair of vertically adjacent panels and communicating with a drainage channel member, whereby water intruding behind the panels is conducted horizontally by the drainage troughs and vertically by the drainage channel members for controlled flow and for collection and removal to the exterior of the building.

4,597,236
HOLLOW WALL CONSTRUCTION
James S. Braxton, 333 E. Ontario St., Chicago, Ill. 60611
Filed Jul. 10, 1984, Ser. No. 629,333
Int. Cl.[4] E04B *1/02*
U.S. Cl. 52—564 **16 Claims**



1. A hollow building wall which comprises:

(a) a first vertical array of stacked, hollow building blocks, said array of building blocks having an inner surface and an outer surface;

(b) a second vertical array of stacked, hollow building blocks, said second array of building blocks having an inner surface and an outer surface,

each block in said first and second vertical arrays of building blocks:

(i) being integrally formed and having an inner wall and an outer wall,

(ii) having a plurality of cross walls to form at least one cavity within said block extending from top to bottom thereof, and

(iii) being connected at each of its ends by positive attachment means with at least one horizontally adjacent block in the vertical array of building blocks with which it is associated,

the blocks of each pair of vertically adjacent building blocks in said first and second vertical arrays of building blocks forming a horizontal joint between them,

said second vertical array of building blocks being spaced

from said first vertical array with the inner surfaces of both arrays of building blocks facing each other,

each of said first and second vertical arrays of building blocks defining a plurality of grooves on its respective inner surface, each of said grooves:

(i) being spaced from the ends of each building block of said array of building blocks by which it is defined,

(ii) having reentrant side walls that provide a wider cross section at the rear of the groove than at the mouth thereof, and

(iii) extending continuously, with a constant cross-sectional shape and area, from the top to the bottom of the vertical array of building blocks with which it is associated,

each groove on the inner surface of said second vertical array of building blocks being opposite to and alinged with a groove on the inner surface of said first vertical array; and

(c) a plurality of separately formed, rigid, elongated, separator splines each of which is inserted in and extends between opposite, alinged grooves on the respective inner surfaces of said first and second vertical arrays of building blocks, the edge portions of each of said splines being enlarged to substantially fill the grooves in which said edge portions are inserted,

substantially the entire extent of each of said grooves being occupied by said spline edge portions, with each of said spline edge portions being in contact substantially throughout the length of said edge portion with the rear wall of the groove with which it is associated,

each of said separator splines extending across at least one of said horizontal joints between vertically adjacent building blocks,

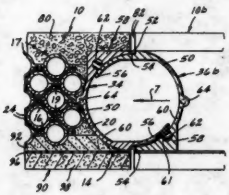
said first and second vertical arrays of building blocks being free of any members interconnecting the same except for said separator splines and any insulation material that may occupy the space between said vertical arrays of building blocks.

4,597,237

MODULAR WALL PANEL AND BUILDING WALL CONSTRUCTED THEREFROM

Aldo Celli, Via Jacopo Palma 9, 20146 Milano, Italy

Filed Jan. 11, 1984, Ser. No. 569,592
Int. Cl.[4] E04B 2/00; E04C 2/04
U.S. Cl. 52—601 **15 Claims**



1. A panel for modular construction of a building wall or the like comprising

a flat rectangular core of thermal insulating construction and a rigid rectangular frame assembly surrounding and capturing said core,

said rigid rectangular frame assembly comprising identical frame side rails extending along laterally spaced sides of said core and identical frame end rails extending along longitudinally spaced ends of said core, said side rails being oriented oppositely of each other and said end rails being oriented oppositely of each other outwardly of said core and being structured for interengagement with identical complimentarily oriented rails of adjacent panels in assembly to form a building wall,

each of said frame side rails comprising a rigid body having a semicylindrical recess extending entirely along said body, and an integral arcuate flange projecting laterally outwardly from one side edge of said recess and having a part-cylindrical contour at a lesser radius of curvature than said recess, said flanges of said side rails on said panel being disposed adjacent to opposite faces of said core means so that each said flange is positioned and oriented to extend into and nest within a side member recess of an adjacent panel in assembly and so that each said recess is positioned and oriented to receive a side rail flange of an adjacent panel in assembly,

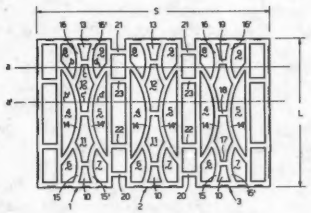
each said side rail further including a pocket in said semicylindrical recess extending throughout the length of said member, and resilient sealing means in said pocket and projecting into said recess so as to be engaged by the flange of an adjacent panel to form an air-tight seal between laterally adjacent panels.

4,597,238

HIGHLY INSULATING BRICK FOR MASONRY

Giuseppe Vadalà, Via Giovanni XXIII, 4-87100 Roggiano Gravina, Italy

Filed Nov. 5, 1984, Ser. No. 668,232
Int. Cl.[4] E04B 1/78
U.S. Cl. 52—606 **5 Claims**



1. A brick preferably made of clay for use in construction, in reinforced concrete and in traditional masonry with a decisive thermal insulating function, which is lightweight, very strong and low in cost, to be used as a self-supporting or sealing or partitioning element,

said brick comprising at least one sub-brick (**1, 2, 3,** or **101, 102, 103, 104**);

each sub-brick including a rectangular peripheral outline having a longitudinal axis and a transverse axis, and being subdivided by means of walls (**14, 14'; 15, 15'; 16, 16'** or **114, 114'; 115, 115'; 116, 116'**) into vertical air chambers, limited in the direction of the longitudinal axis and extensive in the direction of its transverse axis;

said walls forming cores with a crosssection shaped like the arc of a circle, each arc having a center of curvature;

said walls being arranged alternatively concave and convex in the longitudinal direction of the brick;

the centers of curvature of said arcs being aligned along lines parallel to the longitudinal axis of the brick;

wherein the width (b, c, d, b', c', d') of each chamber, taken along a line in the longitudinal direction, forms alternately longer and shorter line segments from one chamber to the next;

the convex sides of the arcs being longitudinally connected to one another by rectilinear arc septa (**17, 18, 19,** or **117, 118, 119**) of minimum lengt; and

sub-bricks (**1, 2, 3,** or **101, 102, 103, 104**) being connected to one another longitudinally by rectilinear sub-brick septa (**20, 21, 22, 23** or **120, 121, 122, 123**), also of minimum length, wherein said rectilinear sub-brick septa are spaced apart from the peripheral outline of the brick, and are not aligned with the walls of the cores of the adjacent sub-brick.

4,597,239

LINING-FRAME OF LATTICEWORK CONSTRUCTION FOR GALLERIES, TUNNELS OR THE LIKE

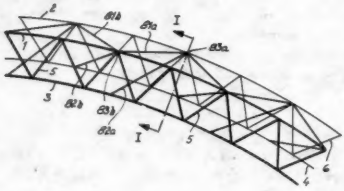
Klaus Matz; Gerhard Ritter; Klaus Ritter, and Edgar Pollhammer, all of Graz, Austria, assignors to AVI Alpenländische Veredelungs-Industrie Gesellschaft m.b.H., Graz, Austria

Filed Oct. 10, 1984, Ser. No. 659,256

Claims priority, application Austria, Oct. 19, 1983, 3720/83

Int. Cl.[4] E04B *1/32*

U.S. Cl. 52—644 **5 Claims**



1. In a lining frame of lattice work construction for galleries, tunnels or the like, said frame having a plurality of pairs of belts, each said pair comprising an outer belt and an associated inner belt connected thereto into a trussed lattice arch by a rod chain bent in the form of a wave and fixed at the apices thereof to said inner and outer belts, the improvement comprising at least two of said trussed arches which are planar and are fixed together parallel to one another by planar connector elements arranged at intervals along said arches, each connector element having a shorter arm and a longer arm, running at an acute angle to one another from an apex thereof, said connector elements being arranged regularly circumferentially of said arches, said apices of said connector elements being fixed to different ones of said belts in sequence whilst said two arms of each of said connector elements extend from said apex thereof at one of said belts of one of said trusses as struts toward, and are fixed to, respective ones of said belt of the other of said trusses.

4,597,240

ELECTRIC EYE FOR BAGGING MACHINE

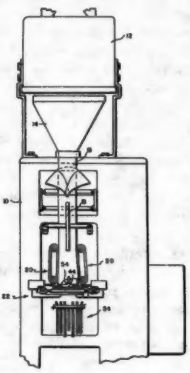
John W. Scully, Raynham, Mass., assignor to Pneumatic Scale Corporation, Quincy, Mass.

Continuation of Ser. No. 431,774, Sep. 30, 1982, abandoned, which is a continuation-in-part of Ser. No. 323,877, Nov. 23, 1981, abandoned. This application Jun. 5, 1985, Ser. No. 742,121

Int. Cl.[4] B65B *57/12, 57/14, 9/20*

U.S. Cl. 53—57 **4 Claims**

1. For forming tubular material into a succession of bags filled with material, apparatus comprising means for feeding tubular material along a predetermined vertical path, means located adjacent said path for at times forming a seal transversely of the tube to form the bottom of successive bags, means for delivering a predetermined amount of material to the tube after the seal has been formed and sensing means located in said path operable in the absence of material within the tube as the tube moves relative thereto to disable the feeding means



and means for overriding the sensing means to insure a minimum length of tube between seals.

4,597,241

LARGE BALING PRESS FOR AGRICULTURAL PRODUCTS

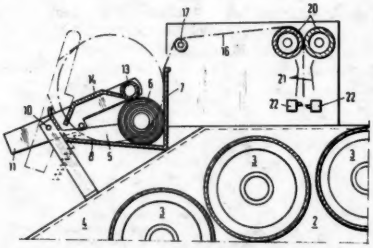
Gerhard Clostermeyer, Gütersloh, Fed. Rep. of Germany, assignor to CLAAS OHG, Harsewinkel, Fed. Rep. of Germany

Filed Jan. 11, 1985, Ser. No. 690,975

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1984, 8401166[U]

Int. Cl.[4] B65B *11/04, 63/04*

U.S. Cl. 53—116 **4 Claims**



1. A large baling press for agricultural products, comprising a housing; a plurality of driven winding elements; a web roller arranged for carrying a web for wrapping of finished bales; a container for receiving said web roller and having at least two walls so that said web roller is supported only by said walls and is in contact with said walls in at least two points during rolling of said web roller without being supported by its axis of rotation; and means for braking said web roller including a braking rod arranged to abut against said web roller, two spring-biased spaced elongated turning levers turnably mounted on said housing at a distance from each other greater than the width of said web roller and having free ends connected by said braking rod, and a flat element mounted on said turning levers to cover the space between said turning levers, so as to connect said turning levers over a greater part of their length and also to prevent sliding of said web roller, which is supported only by said in contact with said walls during its rolling, away from said braking rod through the space between said turning levers.

4,597,242

PROCESS AND APPARATUS FOR THE ASEPTIC PACKAGING OF PRODUCTS SUCH AS FOODSTUFFS AND PHARMACEUTICAL PRODUCTS

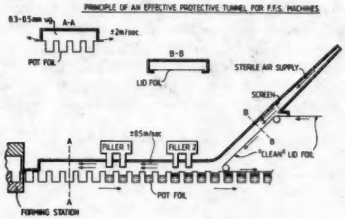
Albertus G. Hendriks, Vlaardingen, Netherlands, and Aart Mijnders, Buggenhout, Belgium, assignors to Lever Brothers Company, New York, N.Y.

Filed Jun. 1, 1983, Ser. No. 500,050

Claims priority, application Netherlands, Jun. 1, 1982, 8202209

Int. Cl.⁴ B65B *55/10*

U.S. Cl. 53—426 **16 Claims**



1. A process for the aseptic packaging of products such as foodstuffs and pharmaceutical products, comprising moving a film web having containers formed therein along a filling track having a longitudinal axis, filling said containers along said track and closing said containers at the end of said track, said track have thereover a tunnel parallel to said longitudinal axis, said tunnel being provided with a single gas flow from a gas supply unit that is as sterile as possible, characterized by introducing said sterile gas so as to flow parallel to said longitudinal axis and only from one longitudinal end at such a pressure and velocity as to cause a slight overpressure in the tunnel, which counteracts the suction of ambient air into the system, and in which the excess of introduced gas escapes through the crevices present, and guiding said gas substantially parallel to said longitudinal axis to cause a flow of low turbulence in the tunnel.

4,597,243

METHOD AND APPARATUS FOR THE STORAGE OF PRODUCTS, ESPECIALLY PRINTED PRODUCTS, ARRIVING CONTINUOUSLY, ESPECIALLY IN AN IMBRICATED FORMATION

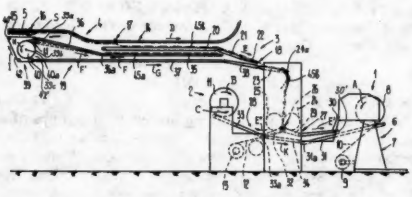
Werner Honegger, Tann-Rüti, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Jul. 24, 1984, Ser. No. 634,029

Claims priority, application Switzerland, Jul. 29, 1983, 4162/83

Int. Cl.⁴ B65B *63/04*; B65H *17/02*

U.S. Cl. 53—430 **27 Claims**



1. In a method for storing substantially flat products, especially printed products, arriving in a continuous formation, especially an imbricated product formation, wherein the products of a first, precursive subformation of said arriving formation and the products of a second subformation of said arriving formation following said first subformation, after a preliminary winding-up of said products of said first subformation to form an intermediate coil, are simultaneously and conjointly wound up at a winding station to form a storage coil, the improvement comprising the steps of:

separating an initial section and a terminal section of said first subformation from an intermediate section lying therebetween;

winding up exclusively products of said intermediate section to form an intermediate coil;

infeeding the products of the second subformation;

unwinding the products of the intermediate section of the first subformation from the intermediate coil during said infeeding of the products of the second subformation;

adjoining said initial section before and said terminal section after said intermediate section unwound from said intermediate coil; and

conjointly winding up both said first and second subformations to form a storage coil.

4,597,244

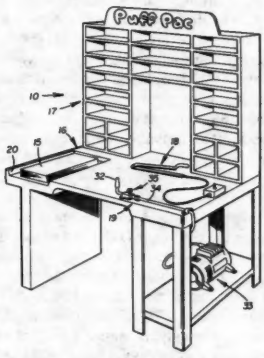
METHOD FOR FORMING AN INFLATED WRAPPING

Daniel A. Pharo, Lodi, Calif., assignor to M & D Balloons, Inc., Brisbane, Calif.

Filed Jul. 27, 1984, Ser. No. 634,986

Int. Cl.⁴ B65B *31/04*

U.S. Cl. 53—434 **7 Claims**



1. A method for forming an inflated wrapping from a preformed envelope having a pair of superimposed panels forming a tubular body defining a first open end extending at least substantially across the full width thereof and a stem having a width substantially less than the width of said body and terminating at a second open end sized to receive a nozzle therein, comprising the steps of

inserting an item through said first open end and into said envelope,

sealing said first open end,

inserting said nozzle into said second open end and said stem,

at least partially inflating said envelope with a pressurized gas injected through said nozzle, and

sealing the second open end of said envelope and said stem to form a fully sealed and inflated wrapping containing said item therein.

4,597,245

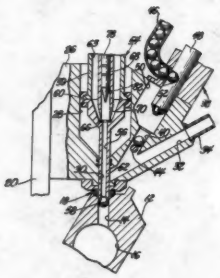
APPARATUS FOR FILLING AND SEALING A CONTAINER

Wendell E. Parker, Traverse City, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Continuation of Ser. No. 364,789, Apr. 2, 1982, abandoned. This application Mar. 29, 1985, Ser. No. 717,484

Int. Cl.[4] B65B *31/02, 1/04*

U.S. Cl. 53—510 **12 Claims**



1. A filling assembly (10) for filling a container (12) through a receiving passage (14) of a predetermined length therein with particulate material, said assembly (10) including a housing (26) having a fill passage (30) for communicating with the receiving passage (14) of a container (12), by snout means (54) movably supported by said housing (26) and having a material delivery passage (56) for receiving material and having a discharge end (58) opening into the container-receiving passage (14) which is communicating with said fill passage (30), said snout means (54) being movable in said fill passage (30) between an initial position in said fill passage (30) and a fill position extending through said fill passage (30) and, to a predetermined extent, into the receiving passage (14) of the container (12) for delivering material through said delivery passage (56) until the container (12) is full of the material to said discharge end (58) whereupon particulate material flow through said delivery passage (56) automatically ceases, and material delivery valve means (68) movably mounted within said snout means (54) and having a downstream end (70) controlling the flow of material into said delivery passage (56), valve actuation means (74) for moving said valve means within said snout means to terminate the flow of material into said delivery passage (56) after the container (12) is full to said discharge end (58) and snout actuation means (72) for retracting said snout means (54) from the receiving passage (14) of said container (12) to empty the material in said snout means (54) downstream of said downstream end (70) of said material delivery valve means (68) into the receiving passage (14) of the container without overflow of said receiving passage (14), the volume of said delivery passage (56) below said delivery valve means (68) being less than the volume of said predetermined extend of extension of said snout means (54) into the receiving passage (14) of the container (12).

4,597,246

MACHINE FOR WRAPPING AND GROUPING PRODUCTS

Riccardo Mattei, and Antonio Gamberini, both of Bologna, Italy, assignors to G. D. Societa Per Azioni, Bologna, Italy

Filed Nov. 28, 1984, Ser. No. 675,965

Claims priority, application Italy, Dec. 7, 1983, 3648 A/83

Int. Cl.[4] B65B *35/30*

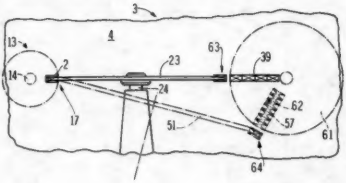
U.S. Cl. 53—542 **3 Claims**

1. A machine for wrapping and grouping products having a substantially parallelepipedic flat shape in packages in which the products can be oriented in at least two different positions, said machine comprising:

a first wheel steppingly rotatable on a horizontal axis and formed with a plurality of equally spaced gripper means extending radially outwardly from said wheel and adapted to releasably hold said products;

a second wheel spaced-apart from said first wheel and steppingly rotatable on a horizontal axis and formed around the periphery thereof with a plurality of equally spaced elongated axial recesses for receiving and grouping said products;

at least two conveyor heads selectively and interchangeably positioned between said first and second wheels and steppingly rotatable on a substantially upright axis, each of said conveyor heads being formed with a plurality of equally spaced recesses around the periphery thereof for directly receiving said products from said grippers, one of said conveyor heads being positioned so that the peripheral recesses thereof are brought into successive registration with said first wheel at a first transfer station, said



peripheral recesses being intersected by the arcuate path of said gripper means at a point on said path whereby said products are deposited in the peripheral recesses of said one of said conveyor heads in a first oriented position, the other of said conveyor heads being positioned so that when the peripheral recesses thereof are brought into successive registration with said first wheel at a second transfer station offset from said first transfer station, the peripheral recesses of said other of said conveyor heads are intersected by said arcuate path at another point thereon whereby said products are deposited in said peripheral recesses in a second oriented position; and

support means for selectively and interchangeably mounting and driving said two conveyor heads depending upon the product orientation chosen, whereby said differently positioned products are conveyed to a third transfer station adjacent said second wheel for deposition of the oriented products successively into said elongated axial recesses of said second wheel for directly forming said groupings to be wrapped.

4,597,247

METHOD AND APPARATUS FOR APPLYING CONTROLLED HEAT TO A GROUP OF ARTICLES DISPOSED WITHIN A SHRINK FILM WRAPPER

Roy A. Johnson, Marietta, Ga., assignor to The Mead Corporation, Dayton, Ohio

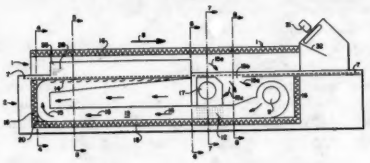
Filed Oct. 15, 1985, Ser. No. 787,256

Int. Cl.[4] B65B *53/06*

U.S. Cl. 53—557 **11 Claims**

1. A shrink tunnel for applying heated air to groups of articles disposed within a wrapper of shrink film whose ends are overlapped and disposed below the articles, said tunnel comprising a conveyor having air passages therethrough on which said groups of articles are disposed in transverse relation therto an which moves through said tunnel, heater means disposed below said conveyor, fan means for driving primary air through said heater means, conduit means for receiving heated primary air from said heater means and for directing heated primary air upwardly through said air passages in said con-

veyor and directly to the overlapped ends of said wrapper and means for directing said heated primary air at a lower temperature downwardly through said air passages in said conveyor



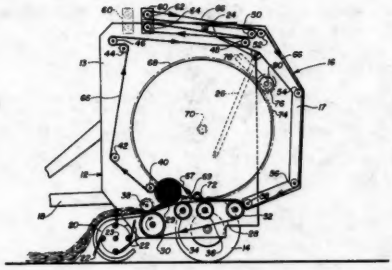
bypassing the heater and thence upwardly and laterally directly to the ends of said groups of articles without reheating said primary air.

4,597,248

METHOD OF OPERATING A ROLL BALER

Willis R. Campbell, Ephrata, and John A. Merkey, Stevens, both of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Jan. 25, 1985, Ser. No. 694,864
Int. Cl.[4] A01D *39/00*
U.S. Cl. 56—1 **3 Claims**



1. A method of operating a baler for forming roll bales of crop material, said baler having upper and lower bale forming means cooperating to define a bale starting zone, said upper bale forming means extending around a single indexing guide member and around a drive member, said single indexing guide member having a home position for disposing said upper bale forming means proximate to said lower bale forming means at the rear of said bale starting zone, said method of operating said baler comprising the steps of:

engaging said drive member with a power source to move said upper bale forming means in a direction to start a roll bale in said bale starting zone;

moving said single indexing guide member from said home position in a substantially circular path of travel when said roll bale reaches a predetermined size;

disengaging said drive member from said power source while said roll bale is being formed and when said single indexing guide member has been moved from said home position less than one full 360° revolution around said path of travel to another position; and

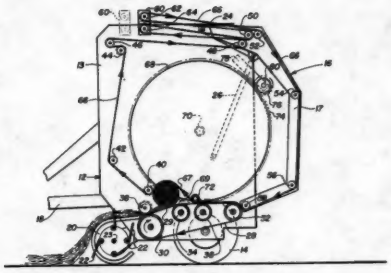
reengaging said drive member with said power source when said single indexing guide member has been moved from said another position back to said home position thereby completing one full 360° revolution for said single indexing guide member around said path of travel during the formation of said roll bale.

4,597,249

METHOD OF FORMING ROLL BALES

Donald F. Bowden, Jr., Gordonville, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Jan. 25, 1985, Ser. No. 694,868
Int. Cl.[4] A01D *39/00*
U.S. Cl. 56—1 **4 Claims**



1. A method of forming roll bales of crop material in a baler having upper and lower bale forming means cooperating to define a bale starting zone, said upper bale forming means extending around a single indexing guide member, said single indexing guide member being located in a home position for disposing said upper bale forming means proximate to said lower bale forming means at the rear of said bale starting zone, said method comprising the steps of:

holding said single indexing guide member in said home position while starting a first roll bale in said bale starting zone;

moving said single indexing guide member from said home position in a substantially circular path of travel when said first roll bale reaches a predetermined size;

returning said single indexing guide member to said home position after one rull 360° revolution around said circular path of travel during the formation of said first roll bale; and

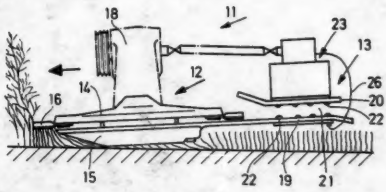
holding said single indexing guide member in said home position again while simultaneously discharging said first roll bale from said roll baler and starting a second roll bale in said bale starting zone.

4,597,250

METHOD OF AN ARRANGEMENT FOR PREPARATION OR CONDITIONING OF AGRICULTURAL PRODUCT

Jean-Pierre Amstutz, Birr, Switzerland, assignor to Bucher-Guyer AG, Niederwenigen, Switzerland

Filed Jan. 17, 1983, Ser. No. 458,753
Claims priority, application Switzerland, Jan. 26, 1982, 462/82; Apr. 1, 1982, 2008/82
Int. Cl.[4] A01D *43/10*
U.S. Cl. 56—16.4 **70 Claims**



1. A method for the conditioning of agricultural stalk products by a mowing device, comprising the steps of passing the

agricultural stalk products through a region provided with an electrical potential difference for forming an electrical discharge.

4,597,251

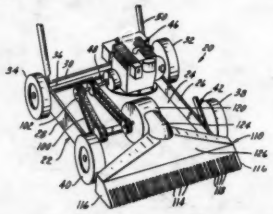
LAWNMOWER

Maurice H. Cornellier, P.O. Box 4104, Dearborn, Mich. 48126

Filed May 2, 1985, Ser. No. 729,861

Int. Cl.[4] A01D *55/02*

U.S. Cl. 56—17.6 12 Claims



1. A lawnmower comprising a support base including a deck, a plurality of wheels and means rotatably mounting said wheels to said deck for carrying said deck over the ground; a power source mounted on said deck; mower means including a pair of elongated mower blades each having a plurality of outwardly projecting blade teeth along one side thereof, means mounting one of said blades in fixed position along a forward edge of said deck with teeth projecting forwardly, means mounting the other of said blades with teeth projecting forwarding adjacent to said one blade for lateral reciprocation with respect thereto, and means coupling said other blade to said power source for reciprocating said other blade to scissor blades of grass positioned among said teeth; a closed blade guard housing carried by said deck along said forward edge and enclosing said blades, said blade guard housing having a lateral array of forwardly opening vertical slots in a forward wall of said housing positioned in front of said blades for receiving and guiding grass to said blades; and a blower having an inlet coupled to said closed guard housing and means coupling said blower to said power source for removing grass clippings from within said closed housing.

4,597,252

PYRETHRUM HARVESTING MACHINES

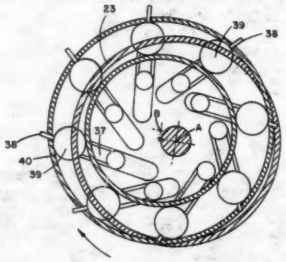
Geoffrey A. Williames, Warragul, Australia, assignor to Geoff. Williames (Aust.) Pty. Ltd., Victoria, Australia

Continuation of Ser. No. 495,765, May 18, 1983, abandoned. This application Jun. 3, 1985, Ser. No. 740,230

Claims priority, application Australia, May 19, 1982, PF4066; Feb. 7, 1983, 11209/83

Int. Cl.[4] A01D *45/00*

U.S. Cl. 56—130 17 Claims



1. A machine adapted for use in harvesting growing flowers each of which has a bloom supported above ground level by an upstanding stem, said machine comprising a mobile chassis; a picking head drum having a plurality of circumferentially spaced openings in its surface; means mounting said drum on said chassis for rotation in one direction about a substantially horizontal axis and at a level to engage the stems of said flowers between the blooms and ground level; a plurality of sets of spaced apart, straight comb-like picking fingers; support means for each of said sets of fingers located within said drum for rotation therewith, said support means supporting the associated set of fingers for reciprocating movements along a linear path through adjacent openings in said drum; cam means carried by said chassis; and cam follower means carried by each of said support means for engagement with said cam means in response to rotation of said drum, said cam means and said cam follower means cooperating with one another during rotation of said drum to cause the fingers of each of said sets to reciprocate through the adjacent openings along said linear path between projected and retracted positions, said cam means and said cam follower means effecting movement of each set of fingers as it moves upwardly from bottom dead center from a retracted position within said drum to a substantially fully projected position, the fingers of each of said sets when in the projected position forming with the adjacent drum surface a substantially constant acute angle in said direction of rotation.

4,597,253

FORAGE OR PICKING HARVESTER UNIT

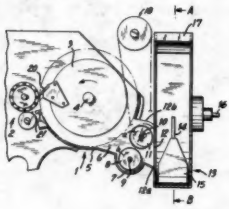
Leo Blümer, Rees, and Xaver Lenzer, Kötz, both of Fed. Rep. of Germany, assignors to Karl Mengele & Söhne GmbH & Co., Günzburg/Donau, Fed. Rep. of Germany

Filed Nov. 28, 1983, Ser. No. 555,382

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1982, 3243955; Apr. 8, 1983, 3312665

Int. Cl.[4] A01D *87/10*

U.S. Cl. 56—13.4 9 Claims



1. Forage or picking harvester unit for grain material including a cylindrical cutter including a cutter housing having a cutter inlet and a cutter outlet for the grain material, an impeller fan for receiving the grain material from a discharge outlet, and a crushing device located in the flow of the grain material between said cylindrical cutter and said impeller fan, wherein the improvement comprises a vertically arranged cutting wheel rotatably mounted about a horizontal axis within said cutter housing, said cutting wheel having a radially outer circumferential edge, said housing including an arcuately shaped base plate extending directly adjacent to and shaped to conform to a part of said circumferential edge below the horizontal axis of said cutting wheel and between said cutter inlet and said cutter outlet, a part of asid base plate extending downwardly and outwardly from said cutter outlet and forming a bowl-like section spaced from said cutter outlet with said base plate inclined downwardly from said bowl-like section to said impeller fan, said impeller fan comprises a vertically arranged fan casing having a fan inlet and a fan outlet and said fan inlet is connected directly to the cutter outlet, said discharge outlet comprises wr'' means forming a rectangularly shaped elongated channel extending generally obliquely downwardly from said circumferential edge to said cutter outlet and with said wall means including said part of said base plate extending downwardly and outwardly from said cutter outlet and having

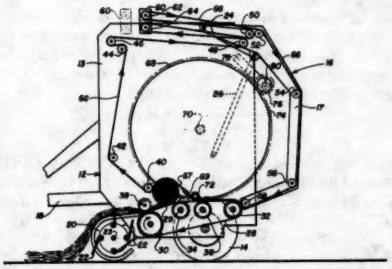
said bow-like section and said part inclined downwardly from said bowl-like section forming the lower side of said channel along with a pair of spaced side walls extending upwardly from said base plate and a top wall opposite said base plate, and said crushing device comprising a pair of crushing rollers located in said channel with said rollers rotating in opposite directions and arranged so that the grain material entering said channel from said cutter housing passes through said channel between said crushing rollers, said crushing rollers being horizontally arranged and spaced from said cutter outlet and having fluted circumferentially extending surfaces with the fluted surfaces extending in the axial direction of said rollers, said crushing rollers being adjustable for providing a smaller clearance therebetween than the thickness of the grain material passing between the rollers, one of said crushing rollers located within said bowl-like section of said base plate spaced downwardly from the other said crushing roller and the other said crushing roller located closer to said fan inlet than said one crushing roller, and the other said crushing roller spaced closely adjacent to said top wall of said channel and the circumferential surface of said other said crushing roller spaced outwardly from said circumferential edge of said cutting wheel so that the grain material moving along the circumferential edge is directed between said crushing rollers.

4,597,254

CONTINUOUS ROLL BALER

Donald F. Bowden, Jr., Gordonville, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Jan. 25, 1985, Ser. No. 694,866
Int. Cl.[4] A01D *39/00*
U.S. Cl. 56—341 **14 Claims**



1. In a baler for forming roll bales of crop material, said baler including lower bale forming means, upper bale forming means cooperating with said lower bale forming means to define a bale starting zone, said upper bale forming means extending around a single indexing guide member, said single indexing guide member having a home position for disposing said upper bale forming means proximate to said lower bale forming means at the rear of said bale starting zone, the improvement comprising:

means for moving said single indexing guide member from said home position in a substantially circular path of travel when a roll bale started in said bale starting zone reaches a predetermined size; and

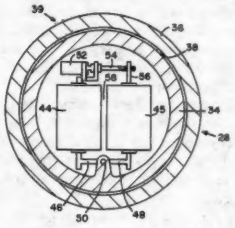
said single indexing guide member being moved one full 360° revolution by said means for moving from said home position around said path of travel and back to said home position during the formation of each roll bale in said baler.

4,597,255

DEVICE FOR CONTROLLING OPTICAL FIBER TWIST ON A BOBBIN

Joe S. Hunter, and Paul B. Ruffin, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 24, 1984, Ser. No. 686,048
Int. Cl.[4] D01H *7/02;* **D07B** *3/02;* **B65H** *59/24*
U.S. Cl. 57—62 **3 Claims**



1. Apparatus for controlling the twist associated with optical fiber wound on a bobbin comprising:

a. a payout spool having an optical fiber wound thereon;

b. a movable takeup spool mounted in spaced relation with said payout spool and disposed for receivimg optical fiber thereon from said payout spool;

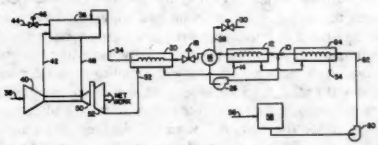
c. a twist and tension control device disposed between said payout spool and said takeup spool for controlling the amount of twist imparted to said optical fiber and for controlling the tension thereof, said twist and tension control device including a stator having a rotor mounted therein, a pair of spaced pivotably mounted rollers disposed for rotation along the longitudinal axis thereof, said optical fiber passing through said rollers, said rollers mounted in said rotor for rotation by said rotor along the axis normal to the longitudinal axis of said roller, and, means for moving said rollers against said optical fiber to provide a squeezing effect thereon to retared the movement of said optical fiber through said rollers, said optical fiber being provided with a predetermined amount of twist responsive to rotation of said rollers by said rotor.

4,597,256

METHOD AND APPARATUS FOR IMPROVED SHUTDOWN PROCEDURES IN DUAL FLUID CHENG CYCLE ENGINES

James Hamill, San Jose; Ramarao Digumarthi; William Conlon, both of Palo Alto; Dah Y. Cheng, Los Altos Hills, and Chun-Nan Chang, Los Altos, all of Calif., assignors to International Power Technology, Inc., Palo Alto, Calif.

Filed Apr. 16, 1985, Ser. No. 723,801
Int. Cl.[4] F02C *7/00*
U.S. Cl. 60—39.05 **1 Claim**



1. The method of shutdown sequencing of a steam-injected gas turbine engine, said engine comprising:

(a) a chamber;

(b) compressor means for introducing air into said chamber;

(c) means for introducing steam within said chamber, including at least a steam injection line;

(d) means for heating said air and steam in said chamber,

including at least fuel flow controls and means for combustion,

(e) turbine means responsive to a mixture of air, combustion products and steam for converting the energy associated with the mixture to mechanical energy, said mechanical energy used to power a work load,

(f) counterflow heat exchanger means, including at least superheater and evaporator and economizer sections, for transferring residual thermal energy from the mixture of air, combustion products and steam exhausted from said turbine means to incoming steam, and

(g) a steam injector control valve, located between, and connected to, said superheater and evaporator sections, said method comprising the steps of:

disengaging said turbine means from its load;

closing said steam injector control valve so as to prevent further flow of steam to said chamber;

continuing to supply fuel and air to said chamber for a short interval after said steam injector control valve has been closed; and

stopping the flow of fuel to said heating means within said chamber.

4,597,257

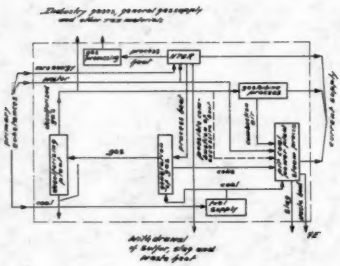
PLANT FOR PREPARING AND HYDROLYZING FOSSIL FUELS TO PREPARE PRODUCTS LOW IN SULFUR CONTENT, AND EMPLOYMENT OF THESE PRODUCTS FOR A COMBINED GENERATION OF THE ELECTRIC CURRENT AND GAS

Ernst Schuster, Gummersbach, and Klaus Knizia, Dortmund, both of Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Continuation of Ser. No. 726,045, Sep. 23, 1976, abandoned, which is a continuation-in-part of Ser. No. 560,574, Mar. 21, 1975, abandoned. This application Jul. 10, 1978, Ser. No. 923,372

Int. Cl.[4] F02B *43/08*

U.S. Cl. 60—39.12 **5 Claims**



1. A plant for producing solid and gaseous desulfurized fossil fuels for use in a gas power plant and a steam power plant for electric current generation, said plant comprising operatively interconnected components sequentially including in combination: crusher means for crushing the fuel to a particle size not to exceed 0.1 mm., a vapor separator, means for supplying hot, substantially inert, flue gas to the crusher means to convey the crushed fuel to the separator with simultaneous evaporation of moisture therefrom, a preoxidation station, means to convey said fuel to said preoxidation station, means to supply heated air to said preoxidation station to oxidize said fuel, a separator for separating the air from said oxidized fuel, a reaction chamber station and means to supply said chamber with the pre-oxidized fuel and in which chamber the gas content of the fuel is adjusted, means for supplying steam to said reaction chamber station to hydrolyze the fuel, a separator station past said reaction chamber station to separate the oxidized fuel from gas, an additional gas driven conveyor and distributor means for distributing the solid product from said reaction chamber station to the steam generator plant, means for extensively desulfurizing gas leaving said separator from said reaction chamber station, distributor means for distributing said desulfurized gas to said gas power plant and at least a portion of said gas to said steam generator plant.

4,597,258

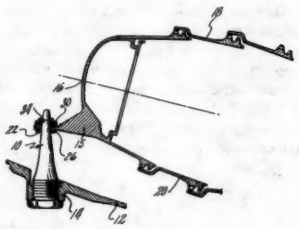
COMBUSTOR MOUNT

Harold S. Harris, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 26, 1984, Ser. No. 675,091

Int. Cl.[4] F02C *7/20*

U.S. Cl. 60—39.31 **5 Claims**



1. For a gas turbine engine, mounting means for attaching the annular burner to the engine case including a mount lug having a relatively flat surface extending from and secured to the annular burner, a mount pin attached to the engine case having one end extending through an opening in the flat surface of said mount lug, a bushing frictionally engaging said pin and extending through said opening, and having a flange surrounding said opening and bearing against one side of said flat surface, a washer fitted over said pin and bearing against the opposite side of said flat surface to sandwich with said flange said mount lug, and said bushing having an increased internal diameter portion adjacent said washer and weldment means securing said washer to said mount lug.

4,597,259

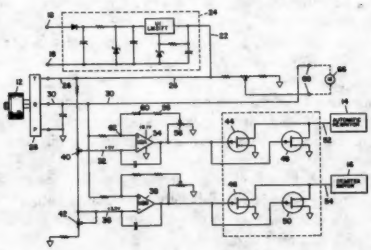
PRESSURE RESPONSIVE ENGINE CONTROL SYSTEM

M. Samuel Moore, and Charles F. Paluka, both of Northridge, Calif., assignors to Semco Instruments, Inc., No. Hollywood, Calif.

Filed May 9, 1984, Ser. No. 608,400

Int. Cl.[4] F02C *7/262*

U.S. Cl. 60—39.091 **2 Claims**



1. A switching control system for a jet or turbine aircraft engine comprising:

electrical pressure transducer means for sensing the pressure

resulting from the operation of the aircraft engine and for providing an electrical output signal representative of said pressure;

an aircraft engine reigniter;

switching electronic circuit means for selectively turning said reigniter on and off;

said switching circuit means including a first input for establishing a switching level for said circuit means, and a second control input means connected to receive said electrical output signals representing pressure;

means for applying an adjustable control signal to said first input;

feedback circuit means associated with said switching circuit for adjusting the hysteresis of said switching circuit to provide first and second different trip points for said switching circuit as the pressure increases or decreases, respectively, toward said trip point;

said system including at least a second aircraft control unit and at least a second switching electronic circuit means connected as defined hereinabove to actuate said second control unit, and including means to actuate said second switching means and said second control unit at different pressures than said first switching means, said second control unit being a jet or turbine engine starter motor; and

said pressure transducer including a variable capacitive unit with a flexible diaphragm.

4,597,260

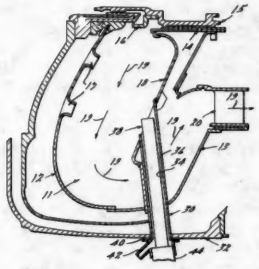
OXYGEN STARTING ASSIST SYSTEM

Rollin B. Balsley, Union Lake, and Daniel J. Morrill, Milford, both of Mich., assignors to Williams International Corporation, Walled Lake, Mich.

Continuation-in-part of Ser. No. 255,313, Apr. 17, 1981, abandoned. This application Jul. 15, 1985, Ser. No. 754,994

Int. Cl.[4] F02C *7/262, 7/266*

U.S. Cl. 60—39.827 **1 Claim**



1. An oxygen starting assist system for facilitating ignition of the normal air-fuel charge in the combustion chamber of a jet engine, said system comprising

a flask of pure oxygen,

a cylindrical igniter extending into the combustion chamber of the engine having means at an inner end thereof for drawing an electrical arc,

a tubular element having a smooth imperforate cylindrical inner wall substantially coextensive with said igniter and disposed in radially outwardly spaced coaxial relation to a central axis thereof so as to define an uninterrupted cylindrical oxygen passage therebetween, and

conduit means connecting said oxygen flask with the cylindrical oxygen passage between said element and said igniter whereby a hollow column of pure oxygen is conducted past the inner end of said igniter so as to surround an arc generated by said igniter without flowing through said arc.

4,597,261

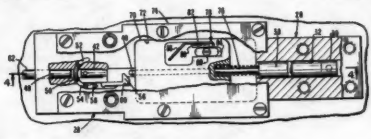
THERMALLY ACTUATED ROCKET MOTOR SAFETY SYSTEM

Cyril F. Dolan, Pacific Palisades, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed May 25, 1984, Ser. No. 614,167

Int. Cl.[4] F02C *9/38*

U.S. Cl. 60—223 **25 Claims**



1. A thermally actuated rocket motor safety system comprising:

a thermal sensor for securing adjacent to a rocket motor and for sensing when temperature thereat reaches a temperature over a time indicating the presence of a fire;

a control module, said control module being connected to receive a signal from said temperature sensor;

means for cutting a rocket motor case for positioning adjacent to the rocket motor case, said means for cutting being connected to said control module to be actuated when said temperature sensor senses the selected temperature and time of heating; and

acceleration sensing means within said control module for sensing acceleration resulting from normal operation of the rocket motor, said acceleration sensing means permitting said temperature sensor to actuate said cutting means only before sensing normal rocket motor acceleration and preventing said temperature sensor from actuating said rocket motor cutting means after normal acceleration.

4,597,262

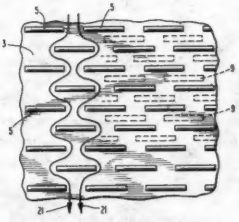
CATALYTIC CONVERTER FOR A DIESEL ENGINE

William B. Retallick, 1432 Johnny's Way, West Chester, Pa. 19382

Filed Sep. 7, 1984, Ser. No. 648,381

Int. Cl.[4] F01N *3/02*

U.S. Cl. 60—274 **30 Claims**



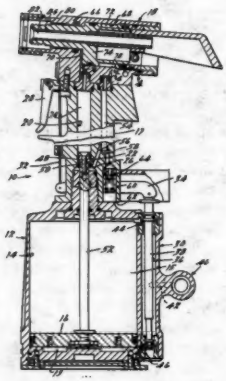
1. A catalytic converter for a diesel engine comprising at least two metal strips having a plurality of indentations, the indentations being of substantially equal height so that the spacing between the strips is equal to this height, the indentations in adjacent strips being offset so that the adjacent strips cannot coincide and nest together, the indentations being aligned transversely to the direction of flow of exhaust gas from the engine, the indentations being staggered, the indentations and the strips defining a tortuous flow path, between the strips, for exhaust gas from the engine, the tortuous flow path including at least one generally right-angle bend relative to the initial direction of flow of gas from the engine, and wherein the metal strips are coated with a combustion catalyst.

4,597,263

PULL TYPE INSTALLATION TOOL

Robert J. Corbett, Saugerties, N.Y., assignor to Huck Manufacturing Company, Irvine, Calif.

Continuation of Ser. No. 85,867, Oct. 18, 1979, abandoned. This application Nov. 12, 1981, Ser. No. 320,193
Int. Cl.[4] B60T 17/22
U.S. Cl. 60—534 13 Claims



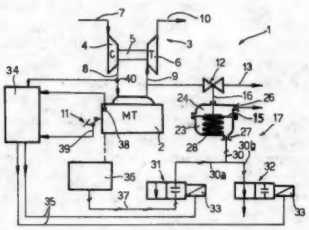
1. In a pneumatic-hydraulically actuated pull type installation tool adapted for use in setting of pull type fasteners comprising a tool housing having a pneumatically actuated piston means, a substantially closed hydraulic circuit containing a hydraulic fluid including a driving portion and a return portion and associated sealing means, control valve means for selectively actuating said pneumatic piston means, said pneumatic piston means being connected to and operative to drive a first hydraulic piston means whereby hydraulic fluid pressure is applied through said hydraulic circuit to a second piston means to thereby reciprocably alternately move said second piston means through a driving stroke and a return stroke, reservoir means having an outlet connected in fluid communication with at least one of said driving portions and return portions of said hydraulic circuit, check valve means connected to said outlet from said reservoir and operative to prevent fluid flow from said driving and return portions of said hydraulic circuits to said reservoir, said reservoir means comprises an elongated reservoir chamber within said housing, a reservoir housing member secured within an opening provided in said housing and having a bore extending therethrough, a plunger movably extending into said chamber and including a portion projecting into said bore, said chamber containing a supply of hydraulic fluid and including means for continuously exerting a pressure on said hydraulic fluid whereby said hydraulic fluid is operative to maintain a minimum positive pressure on said one of said portions of said hydraulic circuit during both said driving stroke and said return stroke to thereby improve the efficiency of said sealing means and reduce leakage of said hydraulic fluid through said sealing means and pressure relief valve means disposed in fluid communication with said one of said driving and return portions of said hydraulic circuit, said pressure relief means being operative to vent said one portion to atmosphere in response to abnormally high pressure therein.

4,597,264

REGULATION DEVICE FOR A TURBO COMPRESSOR UNIT FOR SUPERCHARGING AN INTERNAL COMBUSTION ENGINE

Giovanni Cipolla, Turin, Italy, assignor to Fiat Auto S.p.A., Italy

Filed Nov. 28, 1983, Ser. No. 555,837
Claims priority, application Italy, Dec. 14, 1982, 68463 A/82
Int. Cl.[4] F02B 37/12
U.S. Cl. 60—602 13 Claims



1. A device for regulating a turbo compressor unit (3) for supercharging an internal combustion engine (2), comprising:

(a) a turbine (6) forming part of said turbo compressor unit (3),

(b) a supply duct (9) connected to supply exhaust gas from said engine (2) to said turbine (6),

(c) said supply duct (9) having a branch (13) connected to atmosphere,

(d) a pneumatic pressure limiting valve (12, 12*a*) disposed in said branch (13) and operative to regulate the rate of flow of exhaust gas through said supply duct (9),

(e) said pressure limiting valve (12, 12*a*) being connected to a unit forming two chambers (23, 24; 23*a*, 24*a*) therein,

(f) an actuator (15, 15*a*) separating said two chambers (23, 24; 23*a*, 24*a*),

(g) a stem (16, 16*a*) connecting said pressure limiting valve (12, 12*a*) with said actuator (15, 15*a*) so that a pressure difference between said two chambers (23, 24; 23*a*, 24*a*) causes said actuator (15, 15*a*) to move said stem (16, 16*a*) to thereby control said pressure limiting valve (12, 12*a*),

(h) a first (24, 24*a*) of said two chambers being permanently connected to atmosphere so that said first chamber (24, 24*a*) is maintained at atmospheric pressure,

(i) valve means (31, 32; 42) connected to the second (23, 23*a*) of said two chambers, and with said valve means having a portion connectable to atmosphere,

(j) an accumulator (36) connected to a portion of said valve means and with said accumulator (36) being maintained at a substantially constant pressure different from atmospheric pressure,

(k) and control means (34) connected to actuate said valve means (31, 32; 42) for:

(1) connecting said second chamber (23, 23*a*) alternatively to atmospheric pressure and to said accumulator (36) at said constant pressure different from atmospheric pressure to provide a succession of transitory pressures within said second chamber (23, 23*a*), and for

(2) fluid-tight sealing said second chamber (23, 23*a*) so that a control pressure is created and maintained therein which is continuously variable between the value of said atmospheric pressure and the value of said constant pressure existing in said accumulator (36).

4,597,265

CONTROL SYSTEM FOR AIR CHARGE PRESSURE IN AN INTERNAL COMBUSTION ENGINE

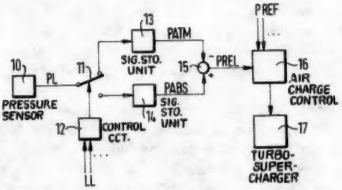
Rainer Buck, Tamm; Wolf Wessel, Oberriexingen, and Gerhard Stumpp, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 9, 1985, Ser. No. 785,849

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1984, 3438176

Int. Cl.[4] F02B 37/00

U.S. Cl. 60—602 6 Claims



1. Control system for the air charge pressure supplied to an internal combustion engine equipped with an adjustable turbo supercharger, comprising means for comparing a measured air charge pressure with a reference air charge pressure and means for adjusting the supercharger to minimize the difference between said measured air charge pressure and said reference air charge pressure, said reference air charge pressure being variable according to conditions under which the engine is operated, said control system further comprising:

means for measuring absolute air charge pressure supplied to said engine for comparison in said system with said reference air charge pressure;

means for storing the measured air charge pressure which is measured during an idling condition of the engine as representative of the atmospheric pressure and means for deriving, from said measured absolute air charge pressure and from said stored value of air charge pressure representative of atmospheric pressure, a signal representative of relative air charge pressure for comparison with said reference air charge pressure.

4,597,266

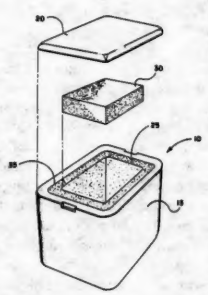
FREEZING AGENT AND CONTAINER

Stephen Entrekin, Birmingham, Ala., assignor to CryoLife, Inc., Sarasota, Fla.

Filed May 28, 1985, Ser. No. 737,680

Int. Cl.[4] F17C 7/00

U.S. Cl. 62—46 4 Claims



1. A solid freezing agent for maintaining a sample at supercold temperatures comprising solid carbon dioxide impregnated with liquid nitrogen to form a mixture of solid carbon dioxide and liquid nitrogen, wherein the solid mixture sublimes without passing through a liquid phase as the mixture warms up.

4,597,267

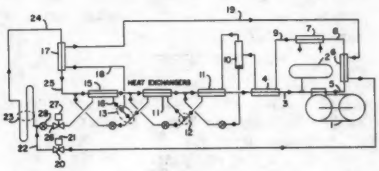
FAST CYCLE WATER VAPOR CRYOPUMP

Scott M. Forrest, San Rafael, Calif., assignor to Marin Tek, Inc., San Rafael, Calif.

Filed Jun. 28, 1985, Ser. No. 749,805

Int. Cl.[4] B01D 8/00

U.S. Cl. 62—55.5 12 Claims



1. A system for controlling the temperature of a cryosurface, comprising:

(a) a single coil cryosurface mounted in a vacuum chamber workspace,

(b) valve means for selectively directing one of relatively cold and relatively hot refrigerant through said coil;

(c) a first continuous refrigerant path controlled by said valve means and including said coil for cooling refregerant from said coil and transferring said cooled refregerant to said valve means, and

(d) a second continuous refrigerant path controlled by said valve means and including said coil for heating a relatively warmer portion of the refrigerant from said first path and transferring said warmed refrigerant to said valve means.

4,597,268

METHOD AND APPARATUS FOR GAS-COOLING

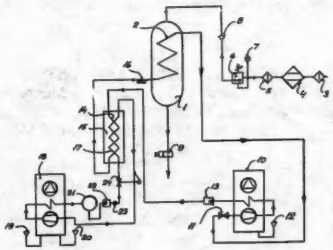
Bengt O. K. Andersson, Torsgrind 73, 432 00 Varberg, Sweden

Filed Feb. 5, 1985, Ser. No. 698,482

Claims priority, application Sweden, Feb. 14, 1984, 8400774

Int. Cl.[4] F17D 17/06

U.S. Cl. 62—93 13 Claims



1. A method for cooling gas to low temperature, wherein the method comprises

(A) drying a gas to be cooled;

(B) feeding the dried gas to an evaporator;

(C) feeding a first cold refrigerant through a refrigerant loop to the evaporator, carrying the refrigerant through the evaporator in heat exchange relation with the dried gas, and removing spent first refrigerant from the evaporator;

(D) cooling spent first refrigerant from the evaporator;

(E) passing the resulting cooled first refrigerant through a heat exchanger;

(F) feeding a second cold refrigerant through another refrigerant loop to the heat exchanger and removing spent second refrigerant from the heat exchanger, wherein the second cold refrigerant entering the heat exchanger has a lower temperature than the first cold refrigerant entering the heat exchanger, and the temperature of the first cold refrigerant is lowered by heat exchange relation with the second cold refrigerant; and

(G) removing cooled gas from the evaporator;

wherein the first cold refrigerant from the heat exchanger is fed through a capillary tube into the evaporator at a temperature of −70° C. to −110° C. and the gas is cooled to a temperature of −70° C. to −110° C.

4,597,269

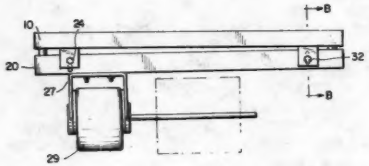
PLASTIC PAN HAVING A REFRIGERATOR SUPPORT

Il Y. Kim, 2915 Wickersham Way, T-2, Falls Church, Va. 22042

Filed Sep. 20, 1984, Ser. No. 652,589

Int. Cl.[4] F25D *21/14*

U.S. Cl. 62—286 **9 Claims**



1. A primary pan assembly adapted to be mounted to the motor of an air conditioning system which comprises

a primary pan provided with a drainage hole on at least on side thereof and stud members extending from the bottom thereof,

a support bracket disposed to support the primary pan,

height-adjustable brackets operatively connected with said support bracket at opposite end portions thereof for varying the height of said height-adjustable brackets relative to each other, said height-adjustable brackets containing apertures for slidably receiving the stud members of said primary pan, and

a motor mount bracket for mounting the pan assembly to the motor, said motor mount bracket containing means for mounting the support bracket to said motor mount.

4,597,270

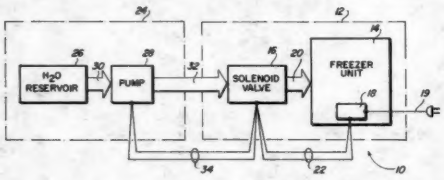
AUTOMATIC ICE-MAKING SYSTEM

William T. Kerr, Lamont, Fla., assignor to Maximma Consumer Technologies, Inc., Tallahassee, Fla.

Filed Oct. 25, 1984, Ser. No. 665,544

Int. Cl.[4] F25C *1/00*

U.S. Cl. 62—138 **7 Claims**



1. An automatic ice-making system for use with a bottled water supply comprising:

(a) a refrigeration unit including a freezer section for receiving and freezing water, said freezer section including a sensor element for providing an output indicating a demand for additional water;

(b) an enclosed reservoir for bottled water adjacent to said refrigeration unit, said reservoir comprising a generally flat container having a U-shaped indentation therein;

(c) a pump positioned within said U-shaped indentation and having a feed line formed of a relatively rigid tube extending into the bottom of said container and in communication with said pump;

(d) a solenoid valve having an input coupled to a water output of said pump and having an output coupled to said freezer section of said refrigeration unit;

(e) a first circuit wire pair coupled between said pump and said solenoid valve, said first circuit wire pair including piggyback prong connectors at the juncture with said valve;

(f) a second circuit wire pair coupled between said sensor element in said freezer section and said piggyback connectors of said first circuit pair and wherein

(g) the sensing of a demand for additional water by said sensing element permits the simultaneous energizing of said pump and the opening of said valve, to permit water to be pumped from said container into said freezer unit.

4,597,271

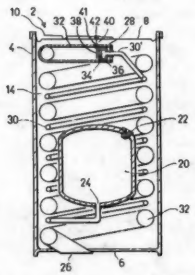
CONTAINER FOR SELF-COOLING THE LIQUID CONTENTS THEREOF

Asher Nof, Balfour Street 39, Haifa 33 274, Israel

Filed Feb. 14, 1985, Ser. No. 701,784

Int. Cl.[4] F25D *3/10*

U.S. Cl. 62—294 **11 Claims**



1. A container for self-cooling the liquid contents thereof, characterized in that said container includes:

a cartridge for a pressurized refrigerant gas;

a gas discharge port leading from the interior of the container to the atmosphere;

conduit means leading from said cartridge to said gas discharge port and passing through the interior of the container to cool the liquid contents thereof when the gas is discharged to the atmosphere via said port, said conduit means having a length many times that of the container and is being formed with a plurality of loops providing a large surface area for cooling the liquid contents of the container, said conduit means including a first section at the end thereof connected to said cartridge, and a second section at the end thereof connected to said gas discharge port, said first section being of smaller diameter than said second section; and

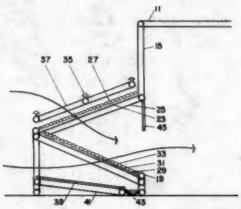
valve means disposed at the juncture of said first and second sections of said conduit means, said valve means being normally closed but manually openable to initiate a rapid discharge of the gas to the atmosphere from said cartridge via said conduit means and said gas discharge port, to thereby cool the liquid contents of the container.

4,597,272

GREENHOUSE LAVA ROCK COOLING PAD

Richard J. Marx, II, and Virginia E. Marx, both of Rte. 1, Box 475, Azle, Tex. 76020

Filed Dec. 19, 1983, Ser. No. 563,200
Int. Cl.[4] F28D *5/00*
U.S. Cl. 62—304 **7 Claims**



1. An evaporative cooling means for cooling the interior of a building having fan means for circulating air through the building, comprising in combination:

a grid mounted to an aperture in a wall of the building and located in a plane that is inclined and transverse to vertical;

a plurality of rocks carried by the grid; and

spray means positioned coextensively over the plane of the grid in a pattern selected for spraying water substantially over all of the grid to wet the rocks, the air drawn by the fan means passing through the rocks and grid and being cooled by the evaporation, the inclination of the grid and the positioning of the spray means enhancing evaporation to increase cooling.

4,597,273

SECURITY DEVICE

Arthur M. Reichenberger, 1915 E. Orange Dr., Phoenix, Ariz. 85016

Continuation-in-part of Ser. No. 474,446, Mar. 11, 1983, abandoned. This application May 14, 1984, Ser. No. 609,850
Int. Cl.[4] E05B *73/00*
U.S. Cl. 70—30 **13 Claims**

1. A security device for lockably tethering ski equipment, which equipment includes

a ski pole having a rigid elongate hollow shaft with an open end and having a resilient grip affixed to said shaft and having an end wall normally closing said open end, and for convenient stowage within said equipment when not in use, said security device comprising:

a. a locking device having an end and including

i. a housing,

ii. a core disposed within said housing and relatively movable between first and second positions,

iii. retention means interacting between said housing and said core proximate said end

said retention means including a passageway formed by a portion of said core and a portion of said housing, said passageway being open in said first position and being closed in said second position, and

iv. locking means interacting between said housing and said core for selectively retaining said core in said second position

b. an elongate flexible member including

i. a fixed end secured to said locking device proximate the end thereof, and

ii. a free end;

c. a retention element carried proximate said free end of said flexible member,

said flexible member being removably receivable within said passageway in said first position

said retention element preventing removal of said flexible element from said passageway in said second position; and

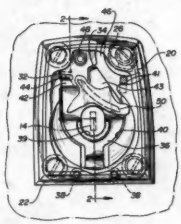
d. stowage means formed in said ski pole for removably receiving said locking device and said flexible member.

4,597,274

LOCK COVER MECHANISM

Charles M. Coscia, Upper Arlington, and Michael K. Scott, Columbus, both of Ohio, assignors to The D. L. Auld Company, Columbus, Ohio

Filed Mar. 14, 1985, Ser. No. 711,969
Int. Cl.[4] E05B *17/18*
U.S. Cl. 70—455 **19 Claims**



1. A cover mechanism for covering a lock, including a lock cylinder having a key opening, mounted on a lock support surface, comprising:

cover plate means, including a cover plate pivotally mounted on a support plate secured to said lock support surface for rotation generally in the plane of said cover plate between a closed position in which said lock is covered and an opened position in which said lock is exposed for insertion of a key into said key opening and a spring means for spring biasing said cover plate toward said closed position,

plate detent means for inserting a first stop into the path of said cover plate after said cover plate is pivoted into its opened position so as to hold said cover plate in said opened position, for moving said first stop out of the path of said cover plate and simultaneously moving a second stop into the path of said cover plate in response to insertion of a key into said key opening so as to maintain said cover plate in said opened position, and for thereafter releasing said cover plate by moving said second stop out of the path of said cover plate as said key is withdrawn

from said key opening, such that said cover plate may be rotated into said closed position by said spring means.

4,597,275

CALENDER

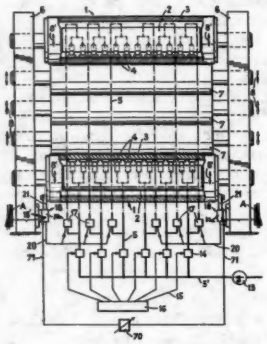
Josef Schneid, Vogt, and Andreas Steidele, Wolperswende-Mochenwangen, both of Fed. Rep. of Germany, assignors to Sulzer-Escher Wyss AG, Zurich, Switzerland

Filed Oct. 9, 1984, Ser. No. 658,816

Claims priority, application Switzerland, Oct. 17, 1983, 5630/83

Int. Cl.[4] B21B *37/08, 31/16*

U.S. Cl. 72—21 9 Claims



1. A calender comprising:

a predetermined number of rolls which are displaceable at least in one pressing direction;

at least one of said predetermined number of rolls constituting a tubular roll comprising a stationary roll support member and a roll shell rotatable about said stationary roll support member and substantially radially displaceable over its entire length;

pressure generating elements supplied with pressure fluid and exerting a supporting force on said roll shell in order to support said roll shell at said stationary roll support member of said tubular roll; at least one position sensor for determining the position of at least one roll of said predetermined number of rolls;

regulating means operatively connected to said at least one position sensor for regulating said position of said at least one roll with respect to at least one predetermined set value; and

said regulating means further regulating the position of said at least one roll of said predetermined number of rolls with respect to a pre-selected number of positional values which differ from each other; and

said regulating means containing control means generating a preselected number of reference values which differ from each other and correspond to said preselected number of positional values.

4,597,276

APPARATUS FOR MAKING HELICALLY WOUND INTERLOCKED TUBULAR STRUCTURE

Lucien Legallais, Orgeval, and Bernard Kuntz, Villemoisson sur Orge, both of France, assignors to Coflexip, Paris, France

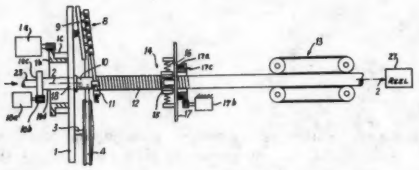
Filed Dec. 5, 1984, Ser. No. 678,297

Claims priority, application France, Dec. 6, 1983, 83 19474

Int. Cl.[4] B21C *37/12*

U.S. Cl. 72—49 7 Claims

1. Apparatus for making a continuous tubular structure of interlocked helically wound strip comprising, a circular plate driven in rotation in one direction around a horizontal axis substantially coinciding with the longitudinal axis of the tubular structure which is formed, said plate having a first side and a second side, support means mounted on said first side of the plate for supporting a supply reel of flat strip, an assembly of driven shaping rollers mounted on said first side of the plate to drive the strip and to form the flat strip into a profiled strip of basically S- or Z-shaped cross-section, means mounted on said first side of the plate between the supply reel and the assembly of shaping rollers for guiding the flat strip from the reel to the shaping rollers, a tubular mandrel coaxial with and on said first side of the plate and onto which the profiled strip from the shaping rollers is helically wound, means for rotating the mandrel in a direction opposite to the direction of rotation of the circular plate, longitudinal extraction means positioned downstream of the plate for withdrawing the tubular structure as it is formed, and for directing the formed structure toward a receiving station downstream of the extraction means, and a plurality of idler pressure rollers mounted on said first side of the plate and circumferentially spaced around said mandrel, said pressure rollers pressing the profiled strip from the shaping rollers against the mandrel, said pressure rollers further pressing against the helically wound profiled strip to interlock successive turns of the strip and to drive the helically wound structure axially in a direction downstream of the circular plate.



4,597,277

PROCESS AND APPARATUS FOR PRODUCING REINFORCED METAL STRIPS

Jean-Paul Esmieu, Coulommiers, France, assignor to Cegedur Societe de Transformation de l'Aluminium Pechiney, Paris, France

Filed Sep. 24, 1984, Ser. No. 653,562

Claims priority, application France, Oct. 10, 1983, 83 16315

Int. Cl.[4] B21H *8/02;* B21B *39/08*

U.S. Cl. 72—182 7 Claims

1. A process for cold rolling metal strips of aluminum or alloys thereof comprising, the steps of:

(a) providing at least one roll comprising an envelope surface and a plurality of circumferential recesses in said surface spaced axially along said roll and defined by two side walls and a bottom wall, each said recess having a depth at least equal to its width, said recesses being spaced by a distance between 0.5 and 3 times said width, wherein said recesses have a dovetail configuration in axial cross-section, said side walls diverging in the direction toward said bottom wall;

(b) introducing a strip of thickness such that the overall rolling effect

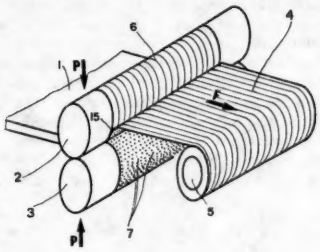
$$\frac{S-s}{S}$$

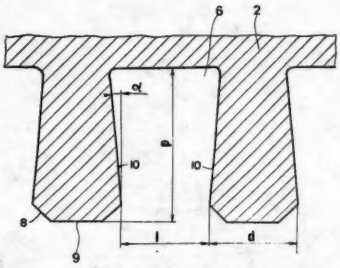
wherein S is the initial strip cross-section and s is the final cross-section is greater than 0.6, with a clamping action (P) between said roll and a second roll;

(c) applying an initial pulling force, to said strip; and

(d) progressively increasing the speed and the pressure of said rolls while increasing the pulling force applied to the strip, so as to produce the desired metal sheet thickness.

4. A cold rolling mill roll for producing strips or metal sheets having raised portions, said roll comprising an envelope surface and a plurality of circumferential recesses in said surface spaced axially along said roll and defined by two side walls and





a bottom wall, each said recess having a depth at least equal to its width, said recesses being spaced by a distance between 0.5 and 3 times said width, wherein said recesses have a dovetail configuration in axial cross-section, said side walls diverging in the direction toward said bottom wall.

4,597,278

METHOD FOR PRODUCING I-BEAM HAVING CENTRALLY CORRUGATED WEB

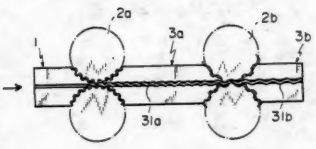
Masami Hamada; Kiyokazu Tanaka; Takeshi Kikuchi, all of Ibaraki; Yasuhiro Asai, Chiba; Chihiro Hayashi, Hyogo, and Fumio Ohtake, Chiba, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Japan

Continuation-in-part of Ser. No. 468,281, Feb. 22, 1983, abandoned, which is a continuation-in-part of Ser. No. 178,634, Aug. 15, 1980, abandoned. This application Jul. 3, 1985, Ser. No. 751,433

Claims priority, application Japan, Aug. 24, 1979, 54-107778; May 9, 1980, 55-61533; May 20, 1980, 55-69414

Int. Cl.[4] B21D *13/04*

U.S. Cl. 72—187 **1 Claim**



1. A method for producing an I-beam having a centrally corrugated web, comprising the steps of:

corrugating a central portion of the web of a finished ordinary I-beam by passing between first and second pairs of complementary intermeshing corrugating rolls of the same dimension in a single pass a finished ordinary I-beam having an uncorrugated web with a thickness t and a web height h for producing in said web by the action of said corrugating rolls thereon corrugations having a width C and an amplitude f and said corrugations being at a pitch L, in the following relationships:

$9.3t < L < 36t$

$1.0t < f < 3.9t$

$0.5h < C < h - L$,

said amplitude f being uniform from substantially one side of said width C to the other;

reducing the thickness of the web by the action of said intermeshing corrugating rolls for increasing the developed lengths S_1 and S_2 of the web portions corrugated by said first and second pairs of rolls as compared to the rectilinear length S_0 of the flat web before corrugation, respectively, while making no other change in the major dimensions of the I-beam, in the following relationships:

$$\epsilon_1 = \frac{S_1 - S_0}{S_0}$$

$$\epsilon_2 = \frac{S_2 - S_1}{S_1}$$

$$\epsilon = \frac{S_2 - S_0}{S_0}$$

$$\epsilon = \epsilon_1 + \epsilon_2$$

$$\frac{\epsilon_1}{\epsilon} = 0.2 \text{ to } 0.8; \text{ and}$$

forming the convex portions of the corrugations worked by said first pair of rolls into the concave portions of the corrugations by said second pair of rolls for improving the residual stress conditions and reducing or eliminating cambering and torsion of the thus corrugated beam.

4,597,279

APPARATUS FOR BENDING HOLLOW SHAPED BAR PORTIONS TO FORM SPACER FRAMES FOR INSULATING GLASS

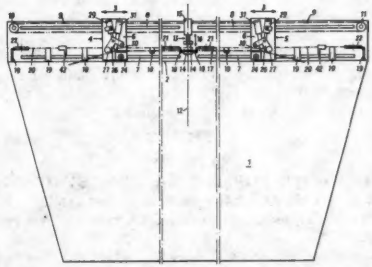
Peter Lisec, Bahnhofstrasse 34, Amstetten-Hausmening, Austria

Filed Nov. 30, 1982, Ser. No. 445,832

Claims priority, application Austria, Jan. 21, 1982, 216/82; Apr. 5, 1982, 1354/82

Int. Cl.[4] B21D *7/025, 7/028, 53/74*

U.S. Cl. 72—306 **5 Claims**



1. Apparatus for bending hollow shaped bar portions to form spacer frames for insulating glass, comprising a pair of bending heads (4, 5) each having upper and lower guide jaws (24, 25) and means (27) pivotal about an axis so that said means pivots toward a hollow bar portion to bend the same 90° about both pairs of guide jaws to form on said hollow bar portion an intermediate section extending between said bending heads and

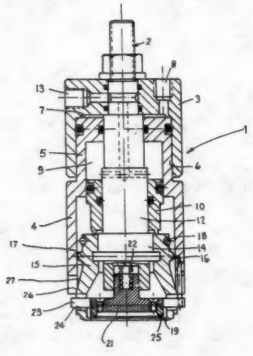
further bent limb sections that extend from opposite ends of said intermediate section in one direction and parallel to each other, means for holding (14) said intermediate sections and mounted between each bending head (4, 5), an ejector bar member (34) on each bending head (4, 5) in such a position that the ejector bar member (34) is adapted to engage the bent limb, means for lifting the ejector bar members (34) parallel to said axis about which said means (27) pivots to engage said bent limb of the frame for raising the bent hollow shaped bar portions (17), and a deflector member (36) on the lower guide jaw (25), said deflector member (36) deflecting the frame in a direction opposite said one direction past the upper guide jaw (24) and transverse to said axis when the ejector bar members are lifted.

4,597,280

HEADPIECE ASSEMBLY

Juan P. Marti, Avenida de Roma 89, Manlleu, Barcelona, Spain

Filed Mar. 4, 1985, Ser. No. 707,780
Claims priority, application Spain, Mar. 3, 1984, 277870[U]
Int. Cl.[4] B21D *11/04*
U.S. Cl. 72—315 **7 Claims**



1. A headpiece assembly for forming a rounded flange, comprising a frame, a headpiece axially slidably supported on the frame for descending axial movement, a pressure plate supported for movement relative to the frame and having an annular forming recess therein for forming the rounded flange, a clamp movably supported adjacent the pressure plate and acted on by the headpiece for movement from a retracted position into a support position, said clamp in the support position having a part therein which is axially aligned directly beneath the forming recess and cooperating therewith to permit forming of the rounded flange, and means cooperating between said headpiece and said pressure plate for effecting movement of the latter toward the clamping part of the clamp when the latter is in its support position.

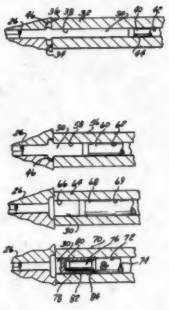
4,597,281

PROCESS FOR FORMING ARTICLES BY HEADING

David S. Brandt, Oneonta, and Samuel J. Costello, Nineveh, both of N.Y., assignors to Allied Corporation, Morristown, N.J.

Division of Ser. No. 499,103, May 28, 1983, Pat. No. 4,498,326. This application Sep. 21, 1984, Ser. No. 653,122
Int. Cl.[4] B21C *37/04*; B21D *7/00*
U.S. Cl. 72—318 **6 Claims**

1. A process of forming an article having large and small opposite ends of two different diameters and a shoulder of larger diameter than either of said small and large diameter opposite ends intermediate said opposite ends from an elongated blank of uniform diameter equal to the small diameter end of said article by heading comprising the steps of gripping a section of said elongated blank in a holder with a portion of said blank section protruding from an end face thereof; successively moving each of a series of coning dies having an end face and a tapered opening of successively larger size and of a larger diameter than the diameter of said blank section opening onto said coning die end face into abutment with said end face of said holder with said protruding section of said blank received within said opening of said respective coning die; said holder formed with a counterbore of a larger diameter than all of said coning die openings, said counterbore opening onto the said end face of said holder, each of said series of coning dies being abutted against said holder and face so that the end face of said coning die and the holder counterbore define a cavity for forming the shoulder forming said blank in a series of



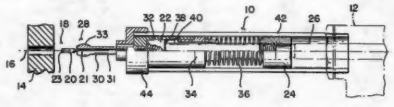
forming steps by independently moving each of a series of punches corresponding to said series of coning dies into said opening of a respective coning die from the opposite direction from said blank into contact with the end thereof while simultaneously forcing said material of said blank section into contact with the tapered interior of said respective coning die opening and said, cavity defined by said coning die end face and said counterbore of said holder by deformation of said blank section material to form said larger diameter end and said shoulder located intermediate said large and small diameter opposite ends by said series of forming steps; withdrawing said each respective coning die and punch after each forming step; and, releasing said formed article from said holder after all of said forming steps in said series are completed.

4,597,282

METHOD AND APPARATUS FOR COLDWORKING HOLES

Franciscus Hogenhout, Redmond, Wash., assignor to West Coast Industries, Inc., Seattle, Wash.

Continuation-in-part of Ser. No. 458,282, Jan. 14, 1983, abandoned. This application Nov. 8, 1984, Ser. No. 669,670
Int. Cl.[4] B21D *41/02*
U.S. Cl. 72—370 **5 Claims**



1. A method for coldworking holes comprising:

a. inserting a mandrel having a larger tapered portion into a hole in an associated workpiece, said mandrel containing a pilot having a large diameter cylindrical end extending from the mandrel, and a small diameter end contained within the mandrel, said mandrel having at least two radially directed slots so as to permit collapse of the larger tapered portion of said mandrel during insertion into the

hole, the larger tapered portion of said mandrel containing an enlarged cylindrical recess therein to matingly receive said large diameter cylindrical end of the pilot without expanding said mandrel;

b. pulling the large diamter end of said pilot through the larger tapered portion of said mandrel until the large diameter end of said pilot is substantially within the enlarged cylindrical recess of the larger tapered portion of said mandrel thereby solidfying said mandrel without expanding said mandrel; and

c. retracting said mandrel containing said pilot from the hole thereby compressing the mandrel in a radial direction taken from the center axis of the hole and causing the hole to be coldworked.

4,597,283

METHOD FOR STRAIGHTENING A RAIL AND STRAIGHTENED RAIL

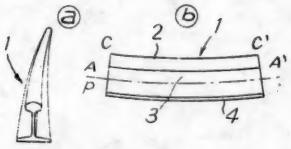
Raymond-Yves Deroche, Thionville; Yves Bourdon, Heining les Bouzonville, and André Faessel, Saint Nicolas en Forêt, all of France, assignors to Societe Anonyme Dite: SACILOR, France

Filed Jun. 25, 1982, Ser. No. 392,216

Claims priority, application France, Feb. 19, 1982, 82 02817

Int. Cl.[4] B21D *1/05, 3/12*

U.S. Cl. 72—378 **6 Claims**



1. A method for straightening a railway rail and removing internal stresses therefrom comprising the steps of:

(a) providing a steel railway rail having an asymetrical profile and triaxial stress distribution pattern, and

(b) simultaneously straightening the rail and removing internal stresses therefrom through stretching the rail by subjecting same to tensile stress exceeding the conventional 0.2% offset yield strength of the steel, and up to a stress value corresponding to a total plastic deformation of the whole rail.

4,597,284

PRESSING TOOL FOR SECURING SCREW CONNECTIONS

Horst Klann, Terra Wohnpark 13, 7730 Villingen-Schwenningen 24, BRD, Fed. Rep. of Germany

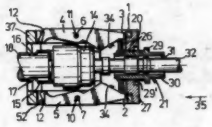
Filed Jan. 14, 1985, Ser. No. 691,447

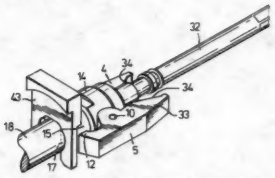
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1984, 8401094[U]

Int. Cl.[4] B21D *7/06*

U.S. Cl. 72—407 **6 Claims**

1. A pressing tool for securing screw connections of steering linkages of motor vehicles particularly between a ball joint socket having a tubular extension and a threaded pin of a pitman arm which has two diametrically opposite parallel wrench flats which are positioned within a tubular extension of the ball joint socket, comprising a tubular sleeve part arranged over the ball joint socket and having two diametrically opposite longitudinally extending slots, a double armed lever pivotally mounted in each slot eccentrically of the axis of said sleeve part and each having a first arm part defining a pressing jaw oriented radially inwardly and an opposite second armed part with a camming surface, and a control member in said tubular sleeve part engageable with said cam surface to pivot said levers, means mounting said control member for axial movement relative to said tubular sleeve part to move said control member along said camming surface to cause pivoting of said double armed levers, said ball joint socket having a deformable portion aligned with each pressing jaw which are deformed by movement of said jaw by said control member to provide formed closing engagement between the flats of said pitman





arm and said ball joint socket, said tubular sleeve part having and end face with a ring part having a slot opening, opening at at least one part of its circumference, and a fork wrench member engageable in said slot and fitting on each side of the flats of said pitman arm for aligning said pressing jaws with said wrench flats.

4,597,285

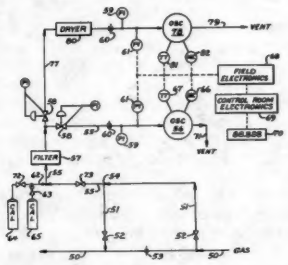
HUMIDITY MONITOR AND METHOD

Paul J. Kuchar, Hinsdale; Robert W. Sampson, Arlington Heights, and Ronald F. Pacanowski, Hoffman Estates, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation of Ser. No. 468,793, Feb. 22, 1983, Pat. No. 4,505,147. This application Oct. 1, 1984, Ser. No. 656,563

Int. Cl.[4] G01N *31/00*

U.S. Cl. 73—29 **9 Claims**



1. A method for determining the moisture content of a sample of gas comprising the steps of:

(a) passing the sample of gas having an unknown moisture content through a fluidic oscillator at a controlled pressure;

(b) measuring the temperature of the sample at said oscillator and transmitting a signal representative of said measured temperature;

(c) measuring the frequency of oscillation of said oscillator and transmitting a signal representative of said measured frequency;

(d) adjusting the moisture content of said subsequent to steps (b) and (c) to provide a second gas sample having a known moisture content which differs from that of the sample passed through the fluidic oscillator in step (a);

(e) passing said second gas sample through said fluidic oscillator at a controlled pressure;

(f) repeating steps (b) and (c) for said second gas sample; and

(g) calculating the moisture content of said gas sample passing through said fluidic oscillator in step (a) by reference to the differences in signals transmitted in connection with the measurement of the respective temperatures of the samples and the frequencies of oscillation in steps (b), (c) and (f).

4,597,286

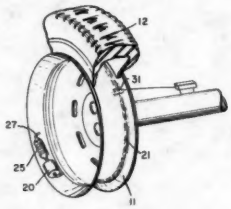
MECHANICAL-ELECTROMAGNETIC PRESSURE SENSOR

Gianluigi Aguglia, 30 Viale Japigia, 73100 Lecce, Italy

Filed Nov. 29, 1983, Ser. No. 556,154

Int. Cl.[4] B60C *23/02*; G01L *7/06, 9/10*

U.S. Cl. 73—146.5 **2 Claims**



1. A remote system for indicating tire pressure including a mechanical electromagnetic pressure sensor which is disposed outside a pnuematic tire which is mounted on a wheel rim, said remote system comprising:

a. a bellows which is fluidly coupled to said pneumatic tire through said wheel rim; and

b. a ferrite rod which is fixedly coupled to said bellows;

c. a passive circuit including a first coil which is mechanically coupled to said wheel rim and a second coil which is electromagnetically coupled to said ferrite rod, which is slidably coupled to said second coil, all of which are electrically coupled in series to form a tuned circuit which resonates at a particular frequency which is dependent on the position of said ferrite rod;

d. an oscillating circuit having a third coil of several turns on a rod of highly permeable material which is disposed adjacent to said first coil of said passive circuit on said wheel rim whereby said passive circuit receives energy from said oscillating circuit whereby the movement of said ferrite rod causes a change in the frequency at which said passive circuit resonates thereby producing a voltage across said third coil of said oscillating circuit which is proportional to the change of pressure in said pneumatic tire;

e. amplifying means for amplifying said voltage which is electrically coupled to said oscillating circuit; and

f. displaying means for displaying said amplified voltage in order to detect the change in frequency at which said passive circuit resonates thereby providing a measure of movement of said ferrite rod in response to the change in pressure of said pnuematic tire.

4,597,287

STABILIZED WIND DIRECTION INDICATOR

Richard R. Thomas, 367 Tranmere Rd., Howrah, Tas. 7018, Australia

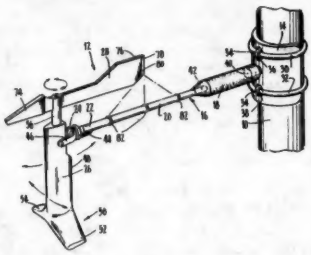
Filed Sep. 18, 1984, Ser. No. 651,827

Claims priority, application Australia, Sep. 19, 1983, PG1466

Int. Cl.[4] G01W *1/00*

U.S. Cl. 73—188 **7 Claims**

1. A wind direction indicator for an unstable platform, including a counter-balance foil for attachment to said platform for movement about two axes relative to said platform, such that said foil tends to assume a particular orientation, despite the orientation, and motion of said platform, by a vane pivotally attached to said counter-balance foil, a spar assembly, said counter-balance foil being connected to one end of said spar assembly, the other end of which is connected to means for attachment to said platform, said spar assembly including a resilient portion connected between said means and a relatively rigid portion, said spar assembly being connected to said counter-balance foil by a universal joint, said counter-balance foil having a generally inverted Y shape, with a stem and a base consisting of wings, and in that said stem is attached to said universal joint towards the top of said stem.



4,597,288

BAROMETER

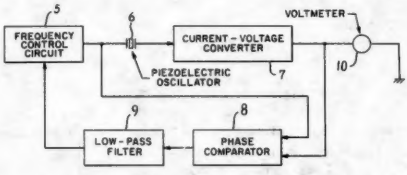
Hideaki Kyogoku, and Fujio Tamura, both of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Mar. 25, 1985, Ser. No. 715,496

Claims priority, application Japan, Mar. 26, 1984, 59-58032; Jun. 25, 1984, 59-130676

Int. Cl.[4] G01L *9/00*

U.S. Cl. 73—384 **3 Claims**



1. In a barometer of the type which measures pressure from an a.c. resistance value of a piezoelectric oscillator disposed inside a pressure vessel, a barometer consisting essentially of:

a frequency control circuit connected to the input of said piezoelectric oscillator;

a current-voltage converter connected to the output of said piezoelectric oscillator;

a phase comparator connected to the output of said frequency control circuit and to the output of said current-voltage converter;

a voltmeter connected to said current-voltage converter;

a low-pass filter connected to said phase comparator; and

input means for applying the output of said low-pass filter to said frequency control circuit;

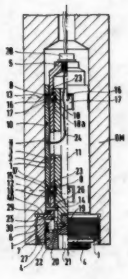
the a.c. voltage value of said piezoelectric oscillator indicating the ambient pressure of a gas around said piezoelectric oscillator

4,597,289

DEVICE FOR MEASURING STRESSES TRANSMITTED BY A SHAFT, IN PARTICULAR TO A DRILL BIT

Georges Obrecht, Seyssins, France, assignor to Alsthom-Atlantique, Paris, France

Filed Jun. 27, 1985, Ser. No. 749,247
Claims priority, application France, Jun. 27, 1984, 84 10138
Int. Cl.[4] E21B *47/00*
U.S. Cl. 73—151 10 Claims



1. A measuring device for measuring the stresses transmitted by a shaft or drill pipe, in particular to a drilling tool, said device comprising, in combination,

a measurement length of shaft of known stiffness,

at least one measuring sensor mounted in said shaft length of known stiffness to supply an output signal representative of the elastic deformation of said length in response to said stresses which it transmits, such that said output signal serves as a measurement signal of said stresses, the improvement wherein said measurement length of shaft includes a compartment, said sensor is carried in a removable instrument socket, arranged coaxially in said compartment formed in said measurement length of shaft, said socket being drawn out and having a longitudinal axis, and including elastically deformable means fitted with a plurality of anchoring means with radially external faces for anchoring themselves in the wall of said compartment, each of said anchoring means being radially mobile between a retracted position where it does not project from the outer surface of said socket, to enable the removal thereof, and a radially thrust out position where it does project from said surface, to anchor itself in said wall, said anchoring means being angularly distributed in two anchoring planes perpendicular to said longitudinal axis so that the socket and the shaft interlock in both of said planes when said anchoring means are thrust out or positively engaged, the length of said socket between said two planes constituting a measurement area, said sensor being attached within said measurement area,

and reversible control means for working said anchoring means to lock or unlock said socket after it has been placed in said compartmeat,

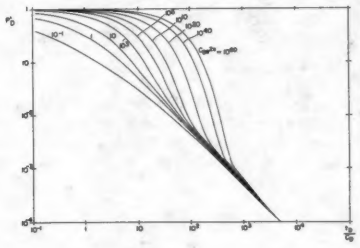
and wherein said socket is slidable, and said control means comprise a plunger operable to slide longitudinally between a first position locking said socket to said side wall and a second position where said socket is slidable relative to said wall, said plunger having a plurality of control inclines respectively operatively engageable, at least indirectly, with said socket anchoring means such that the longitudinal displacement of said plunger from its sliding position to its locking position radially thrusts out each of said anchoring means into positive engagement with said shaft wall.

4,597,290

METHOD FOR DETERMINING THE CHARACTERISTICS OF A FLUID-PRODUCING UNDERGROUND FORMATION

Dominique Bourdet, Vaux-le-Pénil, France, and Timothy Whittle, Salisbury, United Kingdom, assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Apr. 19, 1984, Ser. No. 601,838
Claims priority, application France, Apr. 22, 1983, 83 07075
Int. Cl.[4] E21B *47/00*
U.S. Cl. 73—155 20 Claims



1. A method for determining a physical characteristic of a system made up of at least a portion of a homogeneous or heterogeneous fluid producing underground formation traversed by a wellbore and exhibiting a skin effect and/or a wellbore storage effect, comprising:

changing the rate of flow of the fluid produced;

measuring a parameter characteristic of the pressure P of the fluid at successive times t; from said measurements, evolving the logarithm of the derivative $\Delta P'$ with respect to time t of the pressure P as a function of the logarithm of the corresponding time intervals Δt;

comparing said function evolved from said measurements with an evolution theoretically of the logarithm of the derivative P'_D with respect to the ratio t_D/C_D of the dimensionless pressure P_D as a function of the logarithm of t_D/C_D, represents the dimensionless time and C_D represents the dimensionless coefficient of the wellbore storage effect of fluid in the well;

and

determining from said comparision, at least one of the following characteristics of the system: the product kh of the permeability k multiplied by the thickness h of the formation, the skin effect coefficient S, the wellbore storage coefficient C, the ratios ω of the fluid volume produced by the system, and the delay λ in fluid production by the rock of the formation compared with the production of fluid by the fissures of the formation.

4,597,291

CONNECTIBLE INSTRUMENT CASING

Takehiko Motomiya, Tokyo, Japan, assignor to Ohkura Electric Co., Ltd., Tokyo, Japan

Filed Jul. 31, 1984, Ser. No. 636,231
Claims priority, application Japan, Sep. 23, 1983, 58-146849[U]; Sep. 23, 1983, 58-146850[U]
Int. Cl.[4] G12B *9/02*
U.S. Cl. 73—432 AD 12 Claims

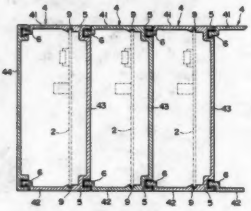
1. A connectible instrument casing, comprising:

a peripheral wall having a top wall, a bottom wall, and a sidewall extending between said top wall and said bottom wall so as to define an inside space with a substantially rectangular cross section;

holder grooves formed on an outer surface of said sidewall along the longitudinal edges of said top wall and said bottom wall; and

coupler means having linear ridges formed along the edges

of said top wall and said bottom wall on opposite side to said sidewall, said linear ridges of said instrument casing being insertible in corresponding holder grooves of an



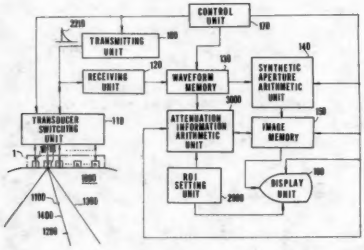
adjacent casing identical with said casing in a longitudinal direction thereof but inseparable from said holder groove of said adjacent casing in a direction lateral to said longitudinal direction once inserted therein.

4,597,292

ULTRASONIC MEASUREMENT METHOD AND APPARATUS THEREFOR

Tadashi Fujii, Fuji, and Yoshinori Hayakawa, Sakura, both of Japan, assignors to Terumo Corporation, Tokyo, Japan, by said Tadashi Fujii

Filed Apr. 22, 1985, Ser. No. 725,797
Claims priority, application Japan, Jun. 28, 1984, 59-131918
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—599 **7 Claims**



1. An ultrasonic measurement method, comprising steps of:

sequentially scanning ultrasonic transceiving means, which is adapted to transmit generally spherical ultrasonic waves having at least three frequency components toward an object under examination, substantially at right angles to a direction in which the ultrasonic waves are transmitted, during which time said transceiving means receives an echo from the object;

measuring the intensity of a reflected wave based on said echo and performing a calculation using a synthetic aperture method to obtain a B-scan distribution image of said intensity in the object; and

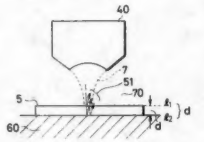
calculating an attenuation coefficient of the object based on the intensity of the reflected wave for a scanning position of said transceiving means generally on an extension of a line connecting plural positions of interest designated in the obtained B-scan distribution image.

4,597,293

SCANNING ACOUSTIC MICROSCOPE

Hiroshi Kanda, Tokorozawa; Isao Ishikawa, Hino; Kageyoshi Katakura, Meguro, and Chitose Nakaya, Nishitama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 9, 1985, Ser. No. 689,955
Claims priority, application Japan, Jan. 11, 1984, 59-1947
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—606 **8 Claims**



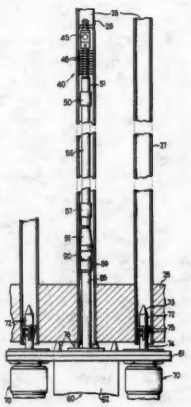
1. In an acoustic microscope having a transducer unit which transmits an ultrasonic beam toward a predetermined focus and which detects reflected acoustic waves caused by the transmission, holding means to hold a sample at and near the focus, and a propagating liquid medium which is held between the sample and the transducer unit, the acoustic impedance of the sample being distributed in a range near the acoustic impedance of the propagating medium, the reflected acoustic waves from the sample being detected and being used as image data for an image distribution of the acoustic impedance of the sample, the improvement comprising a cover member which has an acoustic impedance greater than the acoustic impedance of said propagating medium and said sample is interposed between said propagating medium and said sample.

4,597,294

ULTRASONIC NONDESTRUCTIVE TUBING INSPECTION SYSTEM

Bernard A. Brill, III, Bellevue; Warren R. Junker, Monroeville; John K. White, Bethel Park; Iftikhar A. Rana, East Pittsburgh; Bruce W. Bevilacqua, Irwin; Frank W. Cooper, Jr., Monroeville, and Bruce J. Taszarek, Mt. Lebanon, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 25, 1984, Ser. No. 624,078
Int. Cl.[4] G01N *29/04*; G21C *17/00*
U.S. Cl. 73—623 **12 Claims**



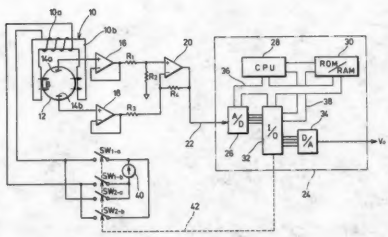
1. A system for determination of the extent of erosion in a degraded area in the wall of a heat exchange tube of a nuclear

system generator, said system comprising: ultrasonic means including transducer means and control means, said transducer means being responsive to said control means for emitting ultrasonic waves and receiving reflected waves generally parallel to an emission axis, drive means coupled to said transducer means for moving it axially and rotatably inside a tube along an inspection region with said emission axis disposed radially of the tube so that said emission axis describes a helical path along the tube wall, said control means being responsive to reflected ultrasonic waves from the inner and outer surfaces of the tube wall for producing a thickness signal indicative of the thickness of the tube wall, a reservoir containing a supply of coupling liquid through which ultrasonic waves can propagate with relatively low attenuation, pump means for transferring a quantity of said coupling liquid from said reservoir to the tube for filling the inspection region thereof and surrounding said transducer means to facilitate the transmission of ultrasonic waves between said transducer means and the tube wall, valve means for controlling the flow of coupling liquid from the tube to said reservoir, means for controlling the operation of said pump means and said valve means, said pump means and said valve means being connected in parallel between said reservoir and the tube, said valve means being closed when said pump means is operated and said pump means being deactuated when said valve means is open, means for producing position signals respectively indicative of the axial and angular position of said transducer means within the tube, and data handling means responsive to said thickness signal and to said position signals for producing a plot of the tube wall thickness around the entire circumference thereof along a predetermined axial extent thereof, thereby to provide a map of the tube wall thickness in the degraded area.

4,597,295
ELECTROMAGNETIC FLOWMETER

Shigeru Goto, and Toshio Sekiguchi, both of Tokyo, Japan, assignors to Yokogawa Hokushin Electric Corporation, Tokyo, Japan

Filed Feb. 19, 1985, Ser. No. 702,493
Claims priority, application Japan, Mar. 16, 1984, 59-50732
Int. Cl.[4] G01F *1/60*
U.S. Cl. 73—861.17 **7 Claims**



1. An electromagnetic flowmeter excited by a rectangular waveform, comprising

excitation means for providing excitation to said flowmeter through repeated cycles, each comprising a first quiescent period, a first excitation period, a second quiescent period, a second excitation period for excitation with a polarity opposite to that of said first excitation period, and a third quiescent period;

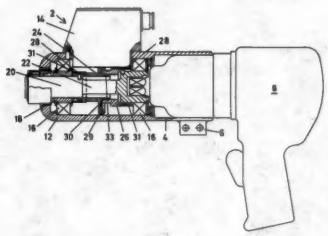
sampling means for sampling a signal from electrodes of said flowmeter at equal sampling intervals in each of the periods except said second quiescent period; and

arithmetic means for effecting an arithmetic operation indicated by $(Z_{01}-2M_1+2M_2-Z_{03})$ using a sampled value Z_{01} in said first quiescent period, a sampled value M_1 in said first excitation period, a sampled value M_2 in said second excitation period, and a sampled value Z_{03} in said third quiescent period.

4,597,296
TORQUE TRANSDUCING ATTACHMENTS FOR AIR-DRIVEN IMPACT TOOLS

David O. Crane, Manor Farm House, Twycross, Leicester; Thomas McDonald, 31 Hardwicke Grove, West Bridgford, Nottingham, and Ronald F. Horner, Flat 1, Hinckley Road, Stoke Golding, Nuneaton, all of England

Filed Sep. 11, 1984, Ser. No. 649,318
Claims priority, application United Kingdom, Sep. 12, 1983, 8324379; Feb. 4, 1984, 8402993
Int. Cl.[4] G01L *3/12*; B25B *23/14*
U.S. Cl. 73—862.33 **22 Claims**



1. A torque transducing system including:

a housing,

a shaft mounted in bearings at the rear end and front end of the housing adapted for receiving input torque from the tool at the rear end and providing output torque to a work piece at the front end, said shaft having a portion transformable by torque intermediate the bearings;

a pair of individually integral bushes each having regularly spaced slots at its periphery in close proximity to each other and individually secured to either side of the torque transformable portion;

a stabilized LED source fixed to the housing for irradiating the bush circumference;

first photo detector means fixed to the housing for providing an output proportional to relative angular bush position through a torque transducing range of the system;

a frequency responsive network for receiving the photo detector means output and providing an output to a control means for interrupting torque when a desired torque has been retained by a member to be fastened; and

pins provided to locate the bushes against angular movement on the shaft and sleeves mounted surrounding each bush to hold the pins captive.

4,597,297
TENSION MEASUREMENT DEVICE

Glendon C. Smith, Anderson, S.C., assignor to Badische Corporation, Williamsburg, Va.

Filed Feb. 28, 1984, Ser. No. 584,367
Int. Cl.[4] G01L *5/10*
U.S. Cl. 73—862.48 **17 Claims**

1. A device for measuring tension in elongated flexible articles, the device comprising:

(a) a support member which is fixed in position; and

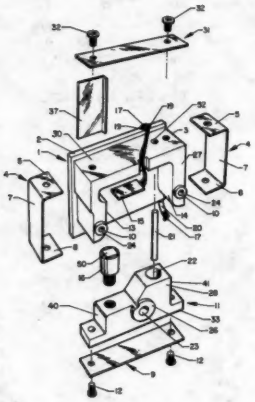
(b) a traveling member; and

(c) an article-contacting means which is attached to the traveling member; and

(d) two deformable, resilient connecting members, each of the connecting members having a first end which is fixedly attached to the support member and a second end which is fixedly attached to the traveling member, the

connecting members providing a resisting force with respect to travel of the traveling member, and

(e) an assembly of the support member, the connecting members, and the traveling member forming a four sided device, the traveling member being displaceable a distance X by a force f, the force f being substantially the same amount of force as is required to deform the resilient



connecting members enough for the traveling member to be displaced the distance X, the traveling member having a displacement range of more than 0.010 inches; and

(f) a position sensor which is comprised of two parts which are separated by a space, the first part of the sensor being mounted on the support member and a second part of the sensor being mounted on the traveling member.

4,597,298

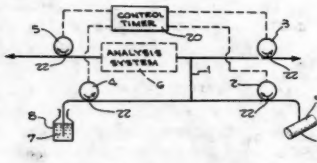
HYDRODYNAMIC SAMPLE INTRODUCING SYSTEM

Jaromir Ruzicka, Holte, and Elo H. Hansen, Lyngby, both of Denmark, assignors to Bifok AB, Sollentuna, Sweden

Continuation of Ser. No. 385,049, Jun. 4, 1982, abandoned. This application Dec. 18, 1984, Ser. No. 683,941

Int. Cl.⁴ G01N *1/02*

U.S. Cl. 73—863.71 **5 Claims**



1. A method for introducing a volume of liquid sample into a liquid carrier stream in a continuous liquid flow analysis system comprising the steps of:

flowing a liquid carrier stream through a conduit having a common inlet through which said carrier stream and a liquid sample stream are both introduced into said conduit, a volumetric conduit portion defining a sample zone having a sample volume and a common outlet through which said carrier stream an said sample stream are both removed from said conduit wherein flowing said carrier stream through said conduit is provided by pumping said carrier stream into said conduit at a location upstream from said conduit and simultaneously pumping said carrier stream from said conduit at a location downstream from said conduit;

maintaining said sample stream in flow communication with both said common inlet and outlet during flow of said carrier stream therethrough, and wherein the flow of said sample stream is stopped during flow of said carrier stream through said conduit;

stopping the flow of said carrier stream through said common inlet into said conduit wherein stopping of said carrier stream flow is provided by simultaneously stopping said pumping at said upstream and downstream locations;

maintaining said carrier stream in flow communication with said volumetric conduit portion at said common inlet and outlet during flow of said sample stream therethrough;

flowing said sample stream through said common inlet, volumetric conduit portion and common outlet to provide a liquid sample volume equal to said sample volume in said volumetric conduit portion;

stopping the flow of said sample stream through said volumetric conduit portion; and

flowing the carrier stream through said conduit to sweep said sample volume from said volumetric conduit portion to thereby introduce said sample volume into said carrier stream.

4,597,299

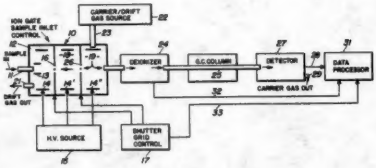
ION GATE SAMPLE GAS INLET CONTROL FOR GAS CHROMATOGRAPH ANALYZER

Donald N. Campbell, Timonium, Md.; Kishore N. Vora, Annandale, Va., and Robert C. Davis, Jr., Westminster, Md., assignors to Allied Corporation, Morristown, N.J.

Filed Mar. 6, 1985, Ser. No. 709,233

Int. Cl.⁴ G01N *1/00*

U.S. Cl. 73—864.81 **8 Claims**



1. A sample gas inlet control for a gas chromatograph analyzer, said chromatograph including an analytic column and means providing a flow of carrier gas through said analytic column, comprising,

means for ionizing said sample gas;

means for forming said ionized sample gas into a stream;

means including a shutter grid having an ion repellant electrostatic charge thereon for normally blocking the flow of said ionized sample gas stream;

means for momentarily removing said ion repellant charge from said shutter grid to permit passage therethrough of a group of ions from said stream;

means for injecting said group of ions into said chromatograph carrier gas flow; and

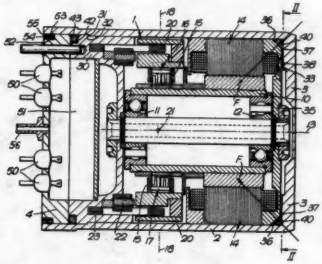
means for deionizing said group of ions in said carrier gas flow prior to entry of said carrier gas flow into said analytic column.

4,597,300

ARRANGEMENTS AND METHODS OF MOUNTING A UNIT IN A CASING

Geoffrey Beardmore, and Antony P. Neville, both of Cheltenham, England, assignors to Smiths Industries Public Limited Company, London, England

Filed Mar. 20, 1984, Ser. No. 591,655
Claims priority, application United Kingdom, Mar. 31, 1983, 8308963
Int. Cl.[4] G01C *19/02*
U.S. Cl. 74—5 R 8 Claims



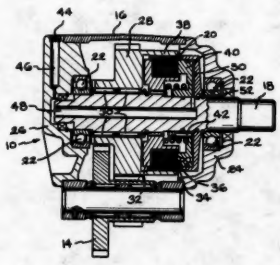
1. Gyroscope apparatus comprising:
an outer casing, said outer casing having a transverse face therein towards a forward end of the casing and having shoulder means towards the rear end of the inside of the casing;
an inner unit located within said outer casing, said inner unit having an inclined edge surface at its forward end which defines with said transverse face an annular recess of substantially triangular section, said inner unit having engagement means towards its rear end located to engage said shoulder means to limit forward displacement of the inner unit along the outer casing;
a ring of resilient material located in said recess;
and means securing said inner unit in said outer casing with the engagement means in contact with the shoulder means and with the resilient ring held in compression between the inner unit and the outer casing.

4,597,301

POWER TAKEOFF SPEED CONTROL ASSEMBLY

Philip J. Weis, Sylvania, Ohio; Richard Cook, Gregory, Mich.; David C. Kaminski, Sylvania, and James E. Smith, Toledo, both of Ohio, assignors to Dana Corporation, Toledo, Ohio

Filed Mar. 30, 1984, Ser. No. 595,512
Int. Cl.[4] F16H *3/700*; F16D *23/00, 43/22, 67/00*
U.S. Cl. 74—15.86 18 Claims



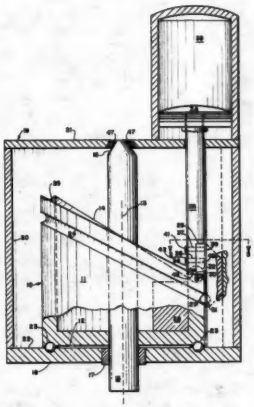
1. A power takeoff assembly comprising, in combination, a power takeoff unit having an input gear and an output shaft, said power takeoff unit being shiftable between an engaged position wherein said output shaft is rotationally driven by said input gear and a disengaged position wherein said output shaft does not rotate;
a speed sensor means adjacent said power takeoff unit for sensing the rotational speed of said input gear;
a valve means in communication with said power takeoff unit for shifting said unit between such engaged and disengaged positions;
a control means in communication with said sensor means and said valve means, said control means including at least one electronic comparator circuit having preset operating parameters for said input gear, said circuit receiving signals from said sensor means and, directing said valve means to disengage said power takeoff unit when the operating condition of said input gear falls outside said preset operating parameters.

4,597,302

MOTION INTERCONVERSION APPARATUS

Martin McLendon, Jr., 11173 Kelowna St. #61, San Diego, Calif. 92126

Filed Oct. 15, 1981, Ser. No. 311,733
Int. Cl.[4] F16H *25/12, 25/16*
U.S. Cl. 74—57 6 Claims



1. Apparatus for the interconversion of reciprocal and rotary motion comprising:
(a) a rotative slant having a circular cylindrical sidewall, a first flat boundary surface disposed perpendicularly to the center axis of said side wall, and a second flat boundary surface inclined at an angle of between 20 degrees and 40 degrees with respect to said first boundary surface;
(b) a first continuous groove recessed into said side wall substantially parallel to said second surface and adjacent thereto, said groove having a uniform cross-sectional configuration in the form of a circular arc;
(c) a second continuous groove recessed into said second boundary surface substantially parallel to said side wall and adjacent thereto, said second groove having a uniform cross-section in the form of a circular arc;
(d) an axle perpendicularly attached to the center of said first boundary surface;
(e) a piston rod aligned laterally offset from and parallel to the longitudinal axis of said axle, said piston rod having a substantially hemispherical upper socket formed in its bottom end;
(f) a first ball adapted to ride within said first groove, and a second ball adapted to have its bottom surface ride within

said second groove and its top surface constrained in the upper socket formed in the bottom end of said piston rod;

(g) retaining means which houses one lateral side of said first ball and maintains it in said first groove while permitting free rotation therein;

(h) straight elongated track means oriented parallel to said center axis;

(i) track engaging means associated with said retaining means and adapted to constrain said retaining means to sliding movement along said track means; and

(j) said piston rod adapted to connect said retaining means with a piston capable of undergoing reciprocal motion.

4,597,303

DRIVABLY CONNECTING CONSTRUCTION IN MEASURING INSTRUMENT

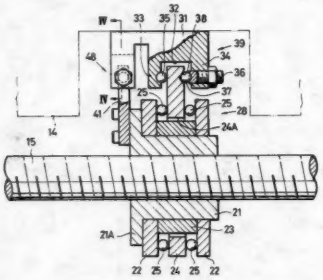
Tadao Nakaya, Utsunomiya, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Nov. 30, 1984, Ser. No. 676,378

Claims priority, application Japan, Dec. 5, 1983, 58-187674[U]

Int. Cl.⁴ F16H *25/24*

U.S. Cl. 74—89.15 **11 Claims**



1. A drivably connecting construction in a measuring instrument for connecting a main body of said measuring instrument to a nut member threadably coupled to a feed screwshaft, said construction comprising:

a connecting plate loosely encircling said nut member and having a pair of oppositely facing surface extending in a direction perpendicularly intersecting an axis of said screwshaft;

first engaging means for engaging opposite sides of said connecting plate to prevent said connecting plate from being displaceable relative to said nut member in a direction perpendicular to said surfaces on said connecting plate;

second engaging means for connecting said connecting plate to said main body of said measuring instrument, said second engaging means engaging opposite sides of said connecting plate to prevent said connecting plate from being displaceable relative to said main body in a direction perpendicular to said surfaces on said connecting plate but allowing a relative tilting movement within a predetermined range; and

third engaging means for limiting rotation of said nut member relative to said screwshaft and to said main body of said measuring instrument, said engaging means including a recess in at least one of said nut member and said main body, said recess having a pair of spaced walls therein, and an arm, one end of which is fixed to at least the other of said nut member and said main body, the other end of said arm being clamped between said pair of spaced walls in said recess, said other end of said arm being spaced a predetermined distance from said of pair of spaced walls in a circumferential direction of said nut member;

said second engaging means including, opposing protrusions forming therebetween a recess for receiving a portion of said connecting plate extended toward said main body of said measuring instrument, balls interposed between opposing surfaces on said protrusions and said extended portion, and an adjusting screw for making a ball on one side of said extended portion adjustable in its position in a direction parallel to said axis of said feed screwshaft.

4,597,304

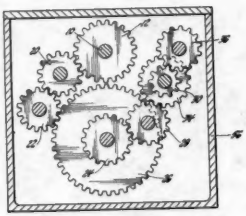
MULTI-SPEED POWER TRANSMISSION

Roy S. Cataldo, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 9, 1984, Ser. No. 658,525

Int. Cl.⁴ F16H *3/02*

U.S. Cl. 74—329 **3 Claims**



1. A power transmission having an input shaft; an output shaft; input gear means drivingly connected with said input shaft; output gear means connected to said output shaft; a plurality of idler gear means; a plurality of ratio gear means, said idler gear means and said ratio gear means being alternately interconnected in meshed relation in series drive arrangement, one of said idler gear means being drivingly connected with said input gear means; selectively engageable clutch means individually connecting respective ones of said ratio gear means with said output gear means and selectively establishing a plurality of drive ratios between said input and output shafts with the highest torque ratio being transmitted through all of said ratio and idler gear means, and the lowest torque ratio being transmitted through only one of said idler gear means and one of said ratio gear means.

4,597,305

SCREW-NUT SCREW COUPLING WITH BALL CIRCULATION AND A METHOD FOR ITS ASSEMBLY

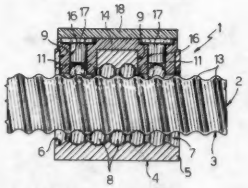
Enzo Brusasco, Turin, Italy, assignor to Roltra S.p.A., Turin, Italy

Filed Jun. 8, 1984, Ser. No. 618,883

Claims priority, application Italy, Aug. 2, 1983, 67836 A/83

Int. Cl.⁴ F16H *1/18, 1/20, 27/02, 29/02*

U.S. Cl. 74—424.8 A **6 Claims**



1. A screw-nut screw coupling with circulating balls, comprising:

a screw;

a nut screw, said screw and said nut screw defining therebetween a helical track;

a plurality of balls interposed between said screw and said nut screw and arranged within said track for rolling therealong, said nut screw having at least one channel commu-

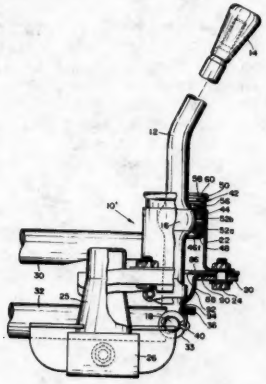
nicating with said track for recirculation of said balls, said channel comprising a recirculation groove provided within said nut screw and connecting together two adjacent turns of said helical track, said nut screw having a ball loading through bore provided in said nut screw and extending outwards from an intermediate point of said recirculation groove, said ball-loading bore having a diameter sized to allow said balls to move therethrough one by one in a sequence; and

removable closure means supported by said nut screw for closing said ball-loading bore.

4,597,306
TRANSMISSION SHIFT LEVER SUPPORTING STRUCTURE

Shinsaku Tsuji, Ebina, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 476,711, Mar. 18, 1983, abandoned. This application Oct. 2, 1985, Ser. No. 782,162
Claims priority, application Japan, Apr. 14, 1982, 57-62240
Int. Cl.⁴ G05G *9/18*
U.S. Cl. 74—473 P **8 Claims**



1. A shift lever supporting structure for pivotally supporting a shift lever secured to a rigid structure of a vehicle body, said lever being formed with an enlarged spherical portion, said shift lever supporting structure comprising:

a hollow member secured to said rigid structure, said hollow member having a bottom portion;

a fixed collar member secured to said hollow member;

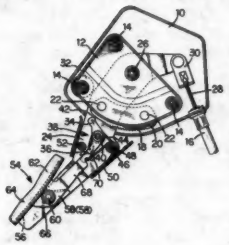
a bearing member held in said collar member and receiving therein the spherical portion of said shift lever so that said shift lever is pivotal about the spherical portion thereof relative to the fixed collar member; and

fail-safe means for assuring the operative pivotal movement of said shift lever even when said spherical portion of the shift lever slips out of said collar member accidently, said fail-safe means including a stopper plate member disposed in the bottom portion of said hollow member and having therethrough a stopper opening through which one end portion of said shift lever passes, said stopper opening having substantially the shape of a circle having a diameter which is equal to the maximum diameter of said spherical portion of said shift lever, a portion of the periphery of said stopper opening projecting within the diameter of the circle so that, upon disengagement of said spherical portion from said bearing member of the fixed collar member, said spherical portion of the shift lever is brought into pivotal engagement with a portion of the periphery of the stopper opening and prevented from slipping out of said opening.

4,597,307
FOOT-OPERATED CONTROL DEVICE FOR PARKING BRAKE

Hiroshi Kawaguchi, Mishima; Shuho Nishina, Susono; Nobuyasu Nakanishi, Toyota, and Yukio Honda, Kariya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Dec. 10, 1982, Ser. No. 448,629
Claims priority, application Japan, Dec. 16, 1981, 56-203229
Int. Cl.⁴ G05G *1/14*
U.S. Cl. 74—512 **8 Claims**



1. A foot-operated device for controlling a parking brake of a vehicle, comprising:

bracket means adapted to be fixed to a frame of the vehicle;

a parking brake pedal supported at a transversely middle portion thereof by said bracket means pivotally about a first axis, and having one end portion to which a brake cable is connected;

a pedal pad connected to the other end portion of said brake pedal pivotally about a second axis parallel to said first axis, said pedal pad being pivoted between its orginal position and its operated position;

ratchet teeth disposed on said bracket means along a circular arc which has a center located at said first axis;

a pawl member connected to said brake pedal pivotally about a third axis parallel to said first axis, and having a pawl engageable with said ratchet teeth;

an extension arm protruding from said pedal pad toward said pawl member; and

spring means, directly engageable with said pawl member and said extension arm, for biasing said pawl member in a first direction to urge said pawl to engage said ratchet teeth while said pedal pad is placed at said original position, and for biasing said pawl member in a second direction to urge said pawl to disengage from said ratchet teeth while said pedal pad is placed in said operated position, the direction of biasing said pawl member by said spring means being changed from said first direction to said second direction through an action of said extension arm incident to pivotal movement of said pedal pad from said original position to said operated position, a biasing force of said spring means in said second direction being smaller than an engagement force existing between said pawl member and said ratchet teeth in engagement with said pawl member.

5. A foot-operated device for controlling a parking brake of a vehicle, comprising:

bracket means adapted to be fixed to a frame of the vehicle;

a parking brake pedal supported at a transversely middle portion thereof by said bracket means pivotally about a first axis, and having one end portion to which a brake cable is connected;

a pedal pad connected to the other end portion of said brake pedal pivotally about a second axis parallel to said first axis, said pedal pad being pivoted between its original position and its operated position;

ratchet teeth disposed on said bracket means along a circular arc which has a center located at said first axis;

a pawl member connected to said brake pedal pivotally about a third axis parallel to said first axis, and having a pawl engageable with said ratchet teeth;

an extension arm protruding from said pedal pad toward said pawl member; and

spring means, associated with said pawl member and said extension arm, for biasing said pawl member in a first direction to urge said pawl to engage said ratchet teeth while said pedal pad is placed at said original position, and for biasing said pawl member in a second direction to urge said pawl to disengage from said ratchet teeth while said pedal pad is placed in said operated position, the direction of biasing said pawl member by said spring means being changed from said first direction to said second direction through an action of said extension arm incident to pivotal movement of said pedal pad from said original position to said operated position, a biasing force of said spring means in said second direction being smaller than an engagement force existing between said pawl member and said ratchet teeth in engagement with said pawl member, wherein said spring means comprises a first spring constantly biasing said pawl member in said second direction, and a second spring normally engaging said pawl member and biasing same in said first direction, a biasing force of said second spring being greater than that of said first spring, said second spring engaging said extension arm and disengaging from said pawl member when said pedal pad is pivoted to its operated position.

4,597,308

METHOD AND APPARATUS FOR CONTROLLING REDUCTION RATIO OF CONTINUOUSLY VARIABLE TRANSMISSION

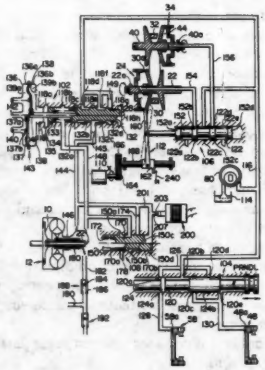
Yoshikazu Tanaka, Yokohama; Sigeaki Yamamuro, Zushi; Keiju Abo, Yokosuka; Haruyoshi Kumura, Yokohama; Hiroyuki Hirano, and Yoshiro Morimoto, both of Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 19, 1983, Ser. No. 486,448

Claims priority, application Japan, Apr. 19, 1982, 57-63869; Apr. 19, 1982, 57-63865

Int. Cl.[4] B60K *41/04*; F16H *11/06*

U.S. Cl. 74—866 **12 Claims**



1. A method for controlling a reduction ratio of a continuously variable transmission of an automotive vehicle having an internal combustion engine, the continuously variable transmission including a shift motor and being shiftable by the shift motor, the method comprising the steps of:

detecting at least one operating condition of the automotive vehicle;

determining a desired optimum reduction ratio indicative signal indicative of a target operating position of the shift motor which corresponds to a desired optimum reduction ratio for the detected operating condition of the automotive vehicle;

generating a reference signal when the continuously variable transmission attains only a single predetermined condition;

comparing an actual reduction ratio indicative signal with said desired optimum reduction ratio indicative signal;

varying said actual reduction ratio indicative signal toward said desired optimum reduction ratio indicative signal in response to the result of said comparing step;

causing the shift motor to vary an operating position thereof in an open loop manner in response to a variation in said actual reduction ratio indicative signal; and

setting said actual reduction ratio indicative signal to a predetermined value in response to said reference signal.

4,597,309

DEVICE FOR REGULATING THE DIRECTION OF ROTATION OF SLOT MACHINE HANDLE

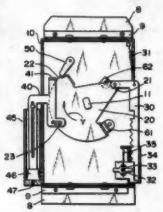
Ikuo Nishikawa, Tochigi, Japan, assignor to Kabushiki Kaisha Universal, Tochigi, Japan

Filed Aug. 1, 1983, Ser. No. 518,937

Claims priority, application Japan, Aug. 2, 1982, 57-116222[U]

Int. Cl.[4] G05G *1/00*

U.S. Cl. 74—575 **7 Claims**



1. A device for regulating the direction of rotation of a handle comprising:

a straight rack member having two notches and a plurality of teeth formed between said notches and movable in the longitudinal direction thereof, means pivotally interconnecting said rack member to said handle about an axis eccentric to the axis of rotation of said handle;

a guide member for supporting said rack member such that said rack member can be moved therethrough, said guide member being pivotably mounted on a common support with said handle about an axis eccentric to both the axis of rotation of the handle and the said axis of pivotal interconnection to permit tilting of said rack member; and

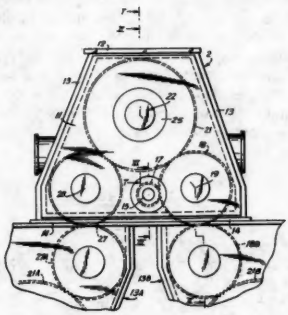
a ratchet pawl rotatably mounted in said guide member, said pawl being engageable with one side of each of said teeth to permit movement of said rack member in only one direction and being swingable over center and engageable with the opposite side of each of said teeth to permit movement of the rack member only in the opposite direction, the spaces between said teeth being too small to permit said over center movement but said notches being sufficiently large to permit said over center movement, whereby the rack member can reverse its direction of movement only when the ratchet pawl is in one of said notches.

4,597,310

DRIVE ARRANGEMENT FOR CYLINDERS IN A PAPER MACHINE

Vaino Panttila, Saynatsalo, Finland, assignor to Valmet Oy, Finland

Continuation-in-part of Ser. No. 411,085, Aug. 23, 1982, abandoned. This application May 20, 1985, Ser. No. 735,781
Claims priority, application Finland, Aug. 26, 1981, 812630
Int. Cl.[4] F16H *37/06, 1/12, 57/02;* F26B *13/18*
U.S. Cl. 74—665 GA 3 Claims



1. A drive arrangement for a group of cylinders comprising two rows of casings, an upper row and a lower row, each row comprising a plurality of trapezoidally-shaped casings,

a cogwheel fixed to an axle journal of a cylinder being situated in each casing, and

at least one side-cogwheel situated in each casing, said side-cogwheel coupled with said cylinder cogwheel in said respective casing and with a side-cogwheel in a vertically-adjacent casing, and wherein

said casings in each row are staggered with respect to vertically-adjacent casings in the next row such that a base of each casing overlaps a portion of a base of a vertically-adjacent casing, said casings of said lower row having a substantially inverted configuration from said casings of said upper row, and

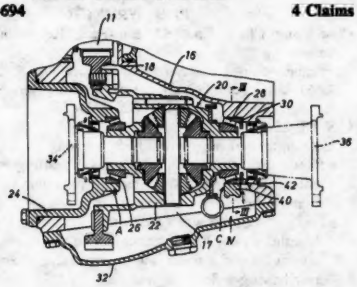
said staggered casings defining ventilation spaces between adjacent casings of the same row and a portion of the base of a vertically-adjacent casing.

4,597,311

FINAL SPEED-REDUCTION GEARING ASSEMBLY IN TRANSMISSION UNIT

Yoshiki Takeda, Aichi, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Mar. 21, 1983, Ser. No. 477,398
Claims priority, application Japan, Mar. 23, 1982, 57-46602
Int. Cl.[4] F16H *37/08, 1/38*
U.S. Cl. 74—694 4 Claims



1. In a final speed-reduction gearing assembly for a transmission unit mounted within a trans-axle casing which carries an output drive pinion shaft thereon, said speed reduction gearing assembly comprising a ring gear in mesh with a drive pinion integral with said drive pinion shaft, and a differential gear unit integrally connected at an outer case thereof with said ring gear, the outer case of said differential gear unit being provided at the opposite ends thereof with first and second cylindrical sleevelike side-journals rotatably supported by first and second axially spaced bearings which are respectively mounted on first and second carrier portions of said trans-axle casing,

the improvement wherein a retainer member is radially detachably fixed to the first carrier portion of said trans-axle casing to fasten said first bearing in place, and an annular shim plate is disposed between the outer end of said first bearing and the inner end wall of the first carrier portion; and

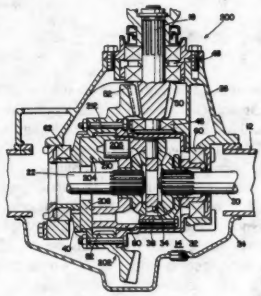
further wherein the first carrier portion includes an opening adjacent the annular shim plate to permit the annular shim plate to be removed and replaced in a radial direction to adjust a preload axially acting on said bearings, and the inner end wall of the first carrier portion is provided with a radial recess through which a tool can be inserted to remove said annular shim plate.

4,597,312

CONVERTIBLE AXLE

Bradford W. Hicks; Jeffrey O. Rolf, both of Mentor, and Lewis J. Valentine, Lyndhurst, all of Ohio, assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 17, 1983, Ser. No. 505,556
Int. Cl.[4] F16H *37/08, 1/40;* B21K *21/16;* B23P *21/00*
U.S. Cl. 74—695 3 Claims



1. A convertible drive axle convertible into and from a first two speed planetary double reduction drive axle embodiment from and into, respectively, a second single speed single reduction drive axle embodiment;

said first embodiment comprising a housing, an input gear driving a ring gear which carries an annular ring of internal gear teeth, a differential gear carrier carrying differential gearing adapted to drive a pair of axle shafts, a plurality of pinion gear pins fixed to the differential carrier and to a high speed clutch plate at opposite ends thereof, said high speed clutch plate fixed to said differential gear carrier, a pinion gear rotatably supported on each pinion gear pin and constantly meshed with said annular ring of internal teeth, a slidable sleeve carrying sun gear teeth constantly meshed with said pinion gears, said sun gear having a first axial position for locking said sun rotationally to said housing and second axial position allowing said sleeve to rotate relative to said housing and rotationally fixing said pinion gear to said ring gear and means for selectively axially shifting said slidable sleeve;

said second embodiment comprising a locking gear and a plurality of locking gear pins utilized interchangeably in

place of said pinion gear pins, pinion gears, high speed clutch plate, slidable sleeve and means for selectively axially shifting said slidable sleeve, said locking gear comprising an annular base member having substantially the same outer diameter and axial thickness as said high speed clutch plate and a plurality of boss members extending axially from said base member and carrying external clutch teeth thereon, said external clutch teeth engagable with said annular ring of internal gear teeth to rotationally fix said locking gear to said ring gear, a plurality of said boss members provided with a bore opening to the end thereof, said bore having an inner diameter slightly greater than the outer diameter of said pinion gear pins, said locking gear pins having substantially the same outer diameter as said pinion gear pins and received in said bores and said differential carrier at opposite ends thereof.

4,597,313

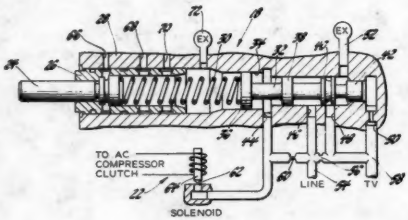
COMPENSATED THROTTLE VALVE

James F. Sherman, Brighton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 17, 1983, Ser. No. 523,937

Int. Cl.⁴ B60K *41/04*

U.S. Cl. 74—861 **1 Claim**



1. An improvement in automatic transmission controls for use with motor vehicles having cyclic engine loads caused by electrically activated accessory operation, and wherein the transmission has a throttle pressure regulator valve responsive to the vehicle throttle position to generate a pressure signal used by the transmission control to in part determine at least a ratio change shift points, said improvement comprising;

pressure responsive differential area means on said throttle pressure regulator valve for effecting a change in the pressure signal generated by said throttle pressure regulator valve; exhaust passage means for connecting said pressure responsive area means to exhaust; and electrical solenoid means including a plunger for closing said exhaust passage means from exhaust to permit a pressure increase on said pressure responsive differential area in response to an increase in engine load caused by electrical actuation of one or more of the accessories whereby the ratio change shift points will be unaffected by the engine load increase.

4,597,314

BOTTLE OPENING MACHINE

Kunio Tamura, and Takayuki Horiai, both of Yokohama, Japan, assignors to Kirin Beer Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 24, 1983, Ser. No. 544,878

Claims priority, application Japan, Oct. 28, 1982, 57-189674; Nov. 11, 1982, 57-198057

Int. Cl.⁴ B67B *7/08*

U.S. Cl. 81—3.2 **6 Claims**

1. A bottle opening machine for removing crown caps from mouths of empty bottles contained in bottle cases which are being conveyed on a conveyance system successively in a single file, said machine comprising essentially,

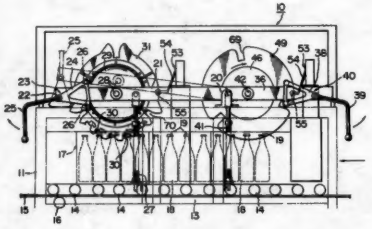
at least one drum rotatably mounted on a frame structure;

a plurality of rotary discs fixedly mounted on said drum, the number of said rotary discs corresponding to that of file rows of the bottles in each bottle case;

a plurality of cap removing sections distributed around the periphery of each of said rotary discs in an equally spaced relation in the peripheral direction, said cap removing sections being so positioned as to correctly register with the positions assumed by the bottle mouths of the bottles in the bottle case, each cap removing section having pawl means adapted to engage the crown caps to be removed;

synchronizing means for ensuring that the respective cap removing sections are correctly brought into engagement with the bottle mouths of the bottles in the bottle cases as the latter are conveyed on the conveyance system,

the synchronizing means comprises a plurality of synchronizing discs fixedly mounted on at least one said drum adjacently to the rotary discs, each said synchronizing disc engaging with a rear and a front transverse walls of at least two consecutive bottle cases;



cap releasing mechanisms for releasing the crown caps held in the cap removing sections after they have been removed from the bottle mouths; and

at least a pair of arms on which the drum is rotatably supported, said arms being adapted to swing about pivotal pins positioned at one end part thereof, said pivotal pins being supported on brackets fixedly disposed on the frame structure,

the cap removing operation comprising engagement of said pawl means with the crown caps in an area where the linear movement path of the bottle mouths and the circular movement path of the pawl means are united with one another in the tangential direction, subsequent removal of the crown caps from the bottle mouths, and final release of the same from the cap removing sections, said removal and release being effected by a moment which is produced by the increased distance by which the circular movement path is separated from the linear movement path past the aforesaid area as the bottle case is conveyed further on the conveyance system.

4,597,315

PIPE WRENCH

Chao-Yang Chen, No. 585, San-Feng Rd., Feng-Yuan City, Taiwan

Continuation-in-part of Ser. No. 667,538, Nov. 2, 1984, Pat. No. 4,561,330. This application Dec. 4, 1985, Ser. No. 805,205

Int. Cl.⁴ B25B *13/22*

U.S. Cl. 81—129.5 **5 Claims**

1. A improved pipe wrench comprising:

a handle having two parallel arms extending from one of its ends, each of said arms having an opening aligned with that of the other one of said arms;

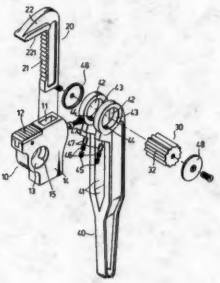
a body placed between said arms for being pivoted to said handle, which has a through-hole in alignment with said openings, and a fixed jaw incorporated therein, said fixed jaw having a first toothed face;

a cylindrical toothed pivot member inserted in said through-hole and said openings;

a detent member mounted in each of said arms and biassed to engage with said toothed pivot member;

a L-shaped member having a rack portion movably inserted in said body and engaging with said toothed pivot member, and a movable jaw extending out of said body, said movable jaw having a second toothed face;

wherein each of said arms further includes a bore communicated with said opening, the axis of said bore being inclined relative to a diameter of said opening intersecting said axis at one end of said diameter, said detent member



being provided in said bore axially and having an engaging face perpendicular to said axis of said bore, and said toothed pivot member including radial teeth extending axially on its periphery, said teeth being capable of engaging said rack portion to move said rack portion inwardly and outwardly, causing said engaging face of said detent member to retract in said bore when said pivot member is moved in a first direction and engaging with said detent member when said pivot member is moved in a second direction opposite to said first direction.

4,597,316

APPARATUS FOR UNWINDING WEB ROLL

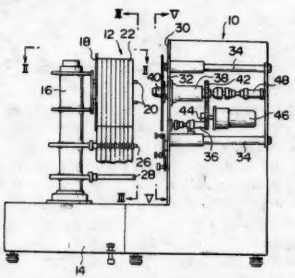
Haruo Ichikawa, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 16, 1984, Ser. No. 661,529

Claims priority, application Japan, Oct. 19, 1983, 58-195482

Int. Cl.[4] B65H *19/22*; B26D *7/00*

U.S. Cl. 83—156 **7 Claims**



1. An apparatus for unwinding a web roll, comprising; web roll storage means for storing a plurality of web rolls, a web delivery location whereat said web rolls are unwound, an unwinding shaft linearly movable between said web roll storage means and said web delivery location for delivering a web roll to said web roll delivery location, cutter means for cutting a forward end portion of a web on a web roll, nip means for clamping a forward end portion of said web after said web has been cut, said cutter means and said nip means being linearly movable together with said unwinding shaft, said unwinding shaft being selectively engagable with a core of said web roll.

4,597,317

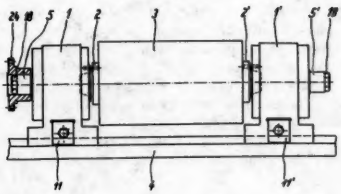
QUICK CHANGE CUTTING CYLINDER ARRANGEMENT

Günter Heyden, Neuwied, Fed. Rep. of Germany, assignor to Winkler & Dunnebier Maschinenfabrik und Eisengiesserei GmbH & Co. KG, Neuwied, Fed. Rep. of Germany

Filed Dec. 27, 1983, Ser. No. 565,466

Int. Cl.[4] B26D *1/62*

U.S. Cl. 83—346 **5 Claims**



1. A quick change cutting cylinder arrangement for letter envelope and hygiene machines wherein the cutting cylinder is bolted in a form-locking manner to a left and a right bearing unit, the arrangement comprising:

(a) a cutting cylinder having at both its end faces coaxially arranged conical cylinder journals;

(b) a bearing unit having a rotating shaft for each end face of said cutting cylinder, each bearing unit having in its rotating shaft an internal conical shape complementary to said conical cylinder journals for receiving the same and having axially pretensioned precision anti-friction bearings without axial or radial bearing play;

(c) means form-locking said bearing units to said conical cylinder journals including an axial through bore in each rotating shaft through which passes a bolt for threadable axial engagement with each said conical cylinder journal for securement therebetween;

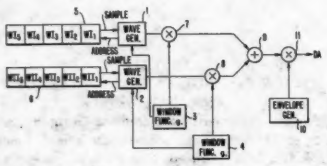
(d) means for rotatably positioning each of said conical cylinder journals with respect to the rotating shaft of the respective bearing unit comprising a positioning pin extending between each conical cylinder journal and the rotating shaft of the respective bearing unit; and

(e) means for mounting said bearing units for precise axial sliding movement on a common parallel guide including fast-acting clamping devices so that changing of said cutting cylinder is thereby facilitated.

4,597,318
WAVE GENERATING METHOD AND APPARATUS USING SAME

Masataka Nikaido, Takatsuki; Kinji Kawamoto, Yahata; Kazuhiro Murase, Hirakata; Tetsuhiko Kaneaki, Ashiya; Tatsuya Adachi, Hirakata, and Sakurako Matsuda, Joyo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 17, 1984, Ser. No. 571,535
Claims priority, application Japan, Jan. 18, 1983, 58-6312; Jul. 20, 1983, 58-133442
Int. Cl.[4] G10H *1/08, 7/00;* G10L *5/02*
U.S. Cl. 84—1.22 21 Claims

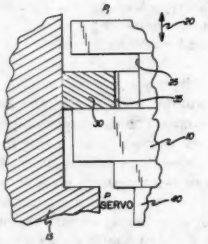


1. A wave generating method comprising the steps of:
generating a plurality of waves having a same period and containing different harmonic components from one another, phase differences among same order harmonic components of said plurality of waves being predetermined phase differences;
generating a plurality of window functions corresponding to said plurality of waves, quantities of said plurality of window functions varying gradually with durations longer than the period of said plurality of waves;
multiplying said plurality of waves by said plurality of window functions, respectively; and
adding the multiplied results to obtain a sound wave;
wherein each of said plurality of waves is changed to a new kind of wave when the quantity of corresponding one of said plurality of window functions becomes zero.

4,597,319
FLUID ACTUATOR SLEW RATE CONTROL

Robert B. Goodman, W. Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 16, 1983, Ser. No. 562,128
Int. Cl.[4] F15B *15/22*
U.S. Cl. 91—27 5 Claims

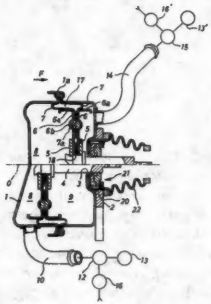


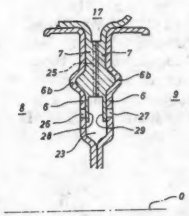
1. In an actuator comprising a cylinder and a piston disposed therewithin and longitudinally movable with respect thereto, said piston including a groove in the outer surface thereof, said groove accommodating a piston ring therewithin, said groove having a width of greater dimension than the thickness of said piston ring, thereby defining a longitudinal clearance therewith, the improvement characterized by means for accurately controlling a slew rate of said piston within said cylinder, said means comprising:
means for initially applying a first, relatively higher pressure to said piston and piston ring, said higher pressure being sufficient to move said ring across said clearance, thereby initiating movement of said piston;
means for discontinuing the application of said high pressure to said piston and piston ring generally simultaneously with said initiation of piston movement; and
means for applying a second, relatively lower pressure to said piston ring generally simultaneously with said initiation of piston movement, said lower pressure being sufficient to sustain actuated movement of said piston at said slew rate.

4,597,320
DIAPHRAGM TYPE VACUUM ACTUATOR

Takenori Kamio, Neyagawa, Japan, assignor to Kabushiki Kaisha Daikin Seasakusho, Neyagawa, Japan

Continuation of Ser. No. 476,511, Mar. 18, 1983, abandoned. This application Apr. 3, 1985, Ser. No. 719,626
Claims priority, application Japan, Mar. 24, 1982, 57-42284[U]
Int. Cl.[4] F15B *9/10*
U.S. Cl. 91—465 2 Claims





1. A diaphragm vacuum, actuator comprising:
a generally cylindrical case,
a rod extending into said case,
means surrounding said rod for sealing said case,
a pair of piston plates mounted on said rod in said case, said piston plates being formed with cylindrical diaphragm support members on their outer peripheral edges extending parallel to said case,
two diaphragms held between said piston plates and connected to an inner peripheral surface of said case dividing the inside of said case into a first chamber and a second chamber and defining an intermediate chamber between said diaphragms, said diaphragm support members preventing said diaphragms from deflecting toward said rod, and
means for selectively subjecting one of said first and second chambers to vacuum and opening the other to atmospheric pressure comprising:
air passages formed in said piston plates, one end of each air

passage being open to one of said first and second chambers and the other end being open to said intermediate chamber, and check valves in said air passages permitting air flow into said intermediate chamber and blocking air flow out of said intermediate chamber, said check valves consisting of reed valve members integrally formed on and extending inwardly from inner radial edges of said diaphragms to cover said other ends of said air passages within said intermediate chamber.

4,597,321

ROTARY VALVE

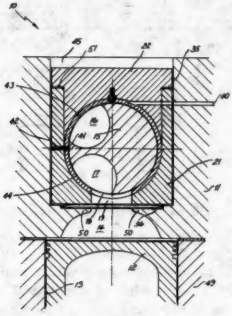
Peter W. Gabelish, 17 Seaview Street, Cronulla, New South Wales 2230; Albany R. Vial, 204 Forest Road, Gymea, New South Wales 2227, and Russell W. Roberts, Lot 16 Coast Road, West Swan, Western Australia 6055, all of Australia

Filed Nov. 18, 1983, Ser. No. 553,433

Claims priority, application Australia, Nov. 19, 1982, PF6890

Int. Cl.[4] F15B *11/08*

U.S. Cl. 91—470 **13 Claims**



1. A rotary valve mechanism for a reciprocating heat engine, the engine having a cylinder, a piston reciprocally movable in the cylinder, and a cylinder head defining a combustion chamber communicating with the cylinder, the cylinder head having a cavity and a port opening defined therein, the cavity communicating with the combustion chamber at the port opening, the rotary valve mechanism comprising:

a valve housing in the cavity; means for permitting movement of the valve housing within the cavity relative to the cylinder head under the influence of gas pressure upon the housing; means in the housing for providing a generally cylindrical inner surface defining a generally circular cavity therein, the housing further having a gas port defined therein for communicating between the port opening in the cylinder head and the circular cavity;

a cylindrical valve rotor rotatably supported in the circular cavity defined in the housing and having a generally cylindrical outer surface in sliding sealing contact with the inner surface provided in the housing, the valve rotor having two rotor ports defined in the outer surface thereof for alternately and periodically communicating with the gas port as the valve rotor rotates; and

mechanical means for rotating the valve rotor in a timed relationship with the movement of the piston;

the valve housing further having a pressure receiving surface disposed toward the port opening in the cylinder head for receiving pressure from working gas in the combustion chamber, the movement permitting means permitting the housing to move under the influence of the gas pressure for applying the received pressure to the outer surface of the valve rotor through the inner surface provided in the housing for providing an effective seal;

the inner and outer surfaces each having three axially adjacent cylindrical zones including an inner exposed zone which is axially between two outer load-bearing zones, the exposed zone including totally within its axial length the gas port as the valve rotor rotates;

the load bearing zones supporting thrust, due to gas pressure, between the inner and outer surfaces;

the valve mechanism further comprising means for delivering lubricant to the load-bearing zones and means between the load-bearing zones and the exposed zone for inhibiting the lubricant from flowing from the load-bearing zones to the exposed zone.

4,597,322

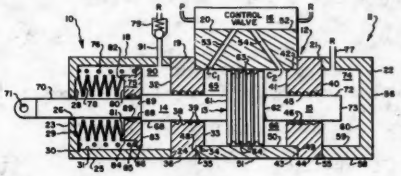
SEAL ASSEMBLIES

Kenneth D. Garnjost, Buffalo, and David J. Flavell, East Aurora, both of N.Y., assignors to Moog Inc., East Aurora, N.Y.

Continuation-in-part of Ser. No. 569,183, Jan. 9, 1984, abandoned. This application Oct. 19, 1984, Ser. No. 662,967

Int. Cl.[4] F16J *15/52, 15/56*

U.S. Cl. 92—60 **24 Claims**



1. In a fluid-powered actuator having a body and a rod, said body having a portion configured as a wall, said rod having an inner portion arranged on one side of said wall, having a penetrant portion passing through an opening in said wall, and having an outer portion arranged on the other side of said wall, the improvement which comprises:

a seal assembly for containing fluid leakage between said rod penetrant portion and said wall opening, said seal assembly including

a first abutment surface on one of said body and rod outer portion;

a sliding-seal member mounted on said rod outer portion for sealed sliding movement therealong toward and away from said first abutment surface; and

a flexible-seal member joining said body and sliding-seal member and defining between said body, said sliding-seal member and said rod outer portion, a sealed chamber communicating with said wall opening.

4,597,323

VEHICLE AIR CONDITIONING INSTALLATION

Manfred Mordau, Wildberg; Gerhard Burk, Sindelfingen, and Albert Stolz, Tübingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 21, 1984, Ser. No. 642,934

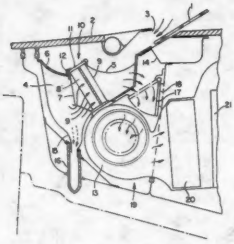
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1983, 3330951

Int. Cl.[4] B60H *1/32;* **B01D** *50/00*

U.S. Cl. 98—2.11 **5 Claims**

1. A fresh air supply device for use with heating, ventilation, and air conditioning installations of motor vehicles having a fresh air inlet at the hood at an interval spaced from the windshield, an air collecting tank downstream from said fresh air inlet, an obliquely positioned filter through which air flows, a ledge means within the air flow and serving to separate moisture from the air flow and to deflect the airstream, and means for discharging said moisture at the base of said tank, further comprising a channel extending from said air inlet and beneath said hood oriented in the transverse direction of the vehicle, a relatively coarse-mesh grill disposed downstream from said channel, said ledge means being disposed adjacent said grill and downwardly pointing and at least partially covering said

dust filter, said dust filter being disposed downstream from said ledge means and arranged in such an oblique position in the



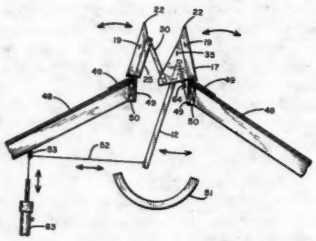
airstream that dust trickling off its dirty side falls freely downward off said dust filter by the action of gravity.

4,597,324

ACTIVE RIDGE VENT

Rodney Spilde, 6300 W. Richmond Rd., Aberdeen, S. Dak. 57401

Filed Apr. 13, 1984, Ser. No. 599,777
Int. Cl.[4] F24F *13/14*
U.S. Cl. 98—42.16 **7 Claims**



1. An active ridge vent for use in combination with a building temperature control system which comprises:

(a) A first door having a mounted member pivotally mounted to one side of an opening at the peak of a gable roof;

(b) An arm connected to the mounting member;

(c) A second door pivotally mounted to the opposite side of the opening at the peak of the gable roof; and

(d) A linkage pivotally connected to the first door and pivotally connected to the second door so that when the arm is moved in one direction, the first and second doors move away from one another and when the arm is moved in an opposite direction, the first and second doors move towards each other.

4,597,325

ROTARY COOKING APPARATUS

Mario Cardullo, Alexandria; Mark Caraluzzi, Vienna, and Peter Schildbach, Alexandria, all of Va., assignors to Yankee Noodle Dandy, Inc., Alexandria, Va.

Filed Apr. 12, 1985, Ser. No. 722,365
Int. Cl.[4] A47J *37/00*
U.S. Cl. 99—404 **7 Claims**

1. A cooking apparatus comprising

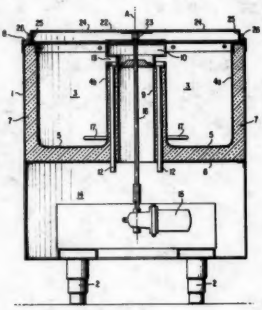
(a) a circular cooking vessel having a bottom, an open top and a vertical central axis;

(b) filling means for introducing water into said cooking vessel to establish a water bath therein;

(c) overflow means having an inlet opening situated at an upper portion of said cooking vessel for removing water and starch or scum from a top part of said water bath;

(d) heating means situated in said cooking vessel for maintaining the water bath at a desired predetermined temperature;

(e) a horizontal circular plate arranged on the circular cooking vessel and covering the open top thereof; said plate having a plurality of circularly distributed apertures and a center traversed by said axis;



(f) support means for supporting said plate for rotation about said vertical axis;

(g) variable-speed motor means operatively connected to said circular plate for rotating said circular plate about said vertical axis at a selected speed; and

(h) a plurality of perforated cooking baskets each fitting in a respective said aperture of said plate; each said basket having

(1) a handle for manually removing the basket from and inserting it into a respective said aperture; and

(2) means cooperating with said plate for suspending the basket, fitted into a respective said aperture, from said plate.

4,597,326

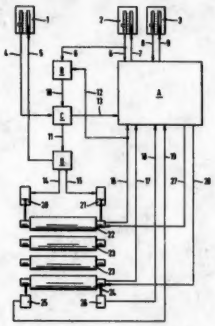
ROLLER PRESS

Tapani, Kultaranta, Järvenpää, Finland, assignor to Oy Wärtsilä Ab, Helsinki, Finland

Filed Sep. 7, 1984, Ser. No. 648,760
Claims priority, application Finland, Sep. 16, 1983, 833307
Int. Cl.[4] B30B *15/14, 15/16*
U.S. Cl. 100—50 **10 Claims**

1. A roller press comprising first and second outer, deflection-compensated rolls and at least one inner roll disposed between the outer rolls whereby a plurality of nips are established between the rolls, each of the outer rolls having a mantle portion that has two ends and engages an inner roll, and a shaft portion that extends axially of the mantle portion and has end sections that project axially beyond the two ends of the mantle portion, and the roller press also comprising load means for applying a press load to the outer rolls by way of the end sections of the shaft portions, press load control means for controlling the magnitude of the press load applied by the load means, first and second mechanisms associated with the first and second outer rolls respectively for applying forces to those rolls to compensate for deflection thereof, said first and second mechanisms providing signals that are representative of the deflection-compensation forces applied to the first and second outer rolls respectively, and regulating means connected to receive said signals and also connected to said press load con-

trol means for maintaining predetermined respective relationships between the deflection-compensation forces applied to



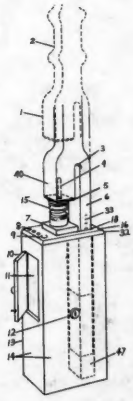
said outer rolls and the magnitude of the press load applied to the outer rolls.

4,597,327

IMPACT CRUSHING DEVICE

Ralph F. Gardner, 2115 Perth St., Toledo, Ohio 43607

Filed Apr. 13, 1984, Ser. No. 600,104
Int. Cl.[4] B30B *9/32*
U.S. Cl. 100—295 **2 Claims**



1. An impact crushing apparatus for crushing objects utilizing manual forces comprising:

(a) a base member, said base member having an upper surface, and having a flat portion on said upper surface, and wherein said base member has a chamber inside said base member, which chamber is longitudinally extending and vertically depending downwardly from an opening in the upper surface of said base member;

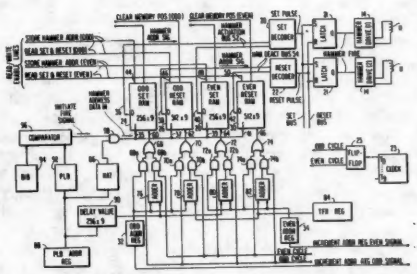
(b) a manually movable and manually propelled ramming device of vertical and longitudinal disposition, with a longitudinally central axis, adapted for crushing objects on the flat portion of the upper surface of said base member, said ramming device comprising an upper longitudinally extending handle portion and having a lower longitudinal portion on a lower part of the ramming device which depends vertically downwardly and which lower longitudinal portion is adapted to fit conformingly into the chamber through said opening in said base member, for free sliding movement of said ramming device reciprocally in said chamber, said ramming device also having a surface portion along its vertical disposition, which surface portion is a flat surface portion extending laterally from said ramming device and facing downwardly towards said base member and which flat surface is disposed perpendicular to the longitudinal central axis of said ramming device, and which flat surface is adapted to engage in a flush manner an object placed on the upper flat portion surface of said base member for crushing said object by the downward manual movement of said device, whereby said ramming device is manually grasped and manually moved in a free sliding vertical movement to crush objects on said flat portion on the upper surface of said base member.

4,597,328

PRINT HAMMER FLIGHT TIME CONTROL SYSTEM

James E. Carrington, Vestal, and Gerald R. Westcott, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 30, 1984, Ser. No. 676,997
Int. Cl.[4] B41J *1/27*
U.S. Cl. 101—93.13 **8 Claims**



1. A method of making the timing of the impact of a set of hammers in an on-the-fly high speed line printer coincide with the alignment of type of a moving type carrier with said hammers, said hammers each having inherent flight times which may differ relative to a predetermined flight time, the method comprising the steps of:

assigning a different hammer address to each of said hammers;

providing stored predetermined time delay values for the respective hammers, each value being related to the actual flight time of a different corresponding one of said hammers such that, when each delay value modifies the time at which its corresponding hammer is fired, the impact of the hammer is timed to occur when the hammer and a type on said type carrier are aligned;

selecting a plurality of hammers to be fired;

storing the addresses of the selected hammers in memory locations of a random access memory means, common to all the hammers, and, for each selected hammer, at a first memory location corresponding to said each selected hammer's predetermined delay value; and

sequentially reading out memory locations so that the stored hammer address in each said first memory location is read out to produce a firing pulse for said each selected hammer such that said timing of the impact thereof occurs when the hammer and the type are aligned.

4,597,329

INKING MECHANISM FOR FRANKING AND PRICE STAMPING MACHINES

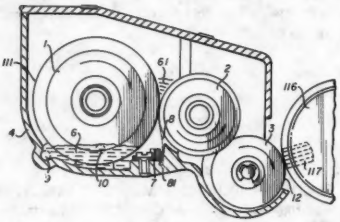
Helmut Lembens, Wiesbaden-Naurod, Fed. Rep. of Germany, assignor to Francotyp-Postalia GmbH, Berlin, Fed. Rep. of Germany

Continuation of Ser. No. 608,017, May 7, 1984, abandoned. This application Sep. 18, 1985, Ser. No. 778,721

Claims priority, application Fed. Rep. of Germany, May 6, 1983, 3316558

Int. Cl.[4] B41F *31/06*

U.S. Cl. 101—363 3 Claims



1. In an inking mechanism for franking and price stamping machines having a printing drum, the improvement comprising a housing having an ink storage trough formed therein, a supply line and a return line connected to said ink storage trough for supplying ink to said ink storage trough, an ink application roller, an inking roller and an ink transport roller each being disposed in said housing, a friction wheel connected to said ink application roller, said friction wheel being driven by the printing drum for driving said ink application roller, said ink application roller having a cylindrical surface contacting said inking roller along the entire width of said ink application roller for driving said inking roller, two friction rings connected to said ink transport roller, said ink transport roller being partially disposed in said ink storage trough and being driven by said inking roller through said friction rings, said ink transport roller transferring ink from said ink storage trough to said inking roller at a given location, said ink transport roller accumulating a wedge-shaped ink quantity from said ink storage trough between said ink transport roller and said inking roller above said given location when said ink transport roller is rotating, a wiper having a free end contacting said inking roller below said given location for metering the ink on said inking roller, said wiper being located downstream of said wedge-shaped ink quantity, and a U-shaped holder clamping said wiper to said housing.

4,597,330

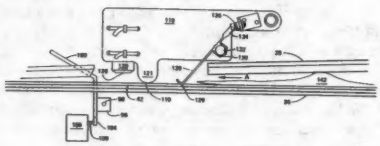
DEPOSITORY ENVELOPE PRINTING MECHANISM

Jeffrey A. Hill; Robert L. Yohn; Ashok L. Modi, and Kevin H. Newton, all of Stark County, Ohio, assignors to Diebold, Incorporated, Canton, Ohio

Filed Nov. 28, 1984, Ser. No. 675,670

Int. Cl.[4] B41J *3/00*

U.S. Cl. 101—93.01 24 Claims



1. A method of printing transaction identifying characters associated with a deposit made into a depository envelope receiving machine on a depository envelope susceptible of uneven thickness contour, said method comprising the steps of:

moving the envelope along an envelope path from an entrance to the path to an end of the path;

detecting the position of a surface of the envelope upon which the transaction identifying characters are printed with tracking means;

printing with a printing device transaction identifying characters on the envelope as the envelope moves along the envelope path; and

moving the printing device closer to or further from the envelope surface upon which transaction identifying characters are printed to maintain a predetermined distance between the printing device and said envelope surface level of the envelope surface tracked.

4,597,331

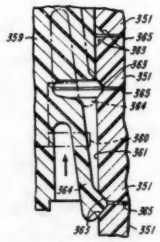
LABEL PRINTING AND APPLYING APPARATUS

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 563,842, Dec. 21, 1983, which is a division of Ser. No. 420,775, Sep. 21, 1982, abandoned, which is a division of Ser. No. 193,553, Oct. 3, 1980, abandoned, which is a division of Ser. No. 653,403, Jan. 29, 1976, Pat. No. 4,249,973, which is a division of Ser. No. 540,051, Jan. 10, 1975, 3,952,652, which is a division of Ser. No. 312,454, Dec. 6, 1972, Pat. No. 3,968,745, which is a continuation-in-part of Ser. No. 208,035, Dec. 8, 1971, abandoned. This application May 31, 1985, Ser. No. 740,119

Int. Cl.[4] B41J *1/60*

U.S. Cl. 101—110 5 Claims



1. A print head, comprising: a plurality of rotatably mounted drive wheels, each drive wheel having a central hole, the holes being aligned to define a continuous opening through the drive wheels, a plurality of different printing elements for each drive wheel, a rotatable and shiftable selector shaft movable in the axial direction and having a driving member in the opening selectably engageable with any drive wheel, the drive wheels being capable of being comprised of one set of at least two different sets of drive wheels, wherein at least one drive wheel of one of the sets differs in width from at least one drive wheel of another set, means for detenting the selector shaft in engagement with any selected drive wheel irrespective of whether the print head is comprised of the one set or of the other set, and wherein the detenting means is operable within the continuous opening.

4,597,332

CHAFF DISPENSER FOR ATMOSPHERIC RE-ENTRY

Leonard M. Hoffman, Burlingame, and John B. Kimball, Menlo Park, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 3, 1964, Ser. No. 415,830

The portion of the term of this patent subsequent to Aug. 1, 2001, has been disclaimed.

Int. Cl.[4] F42B *13/00*

U.S. Cl. 102—505 8 Claims

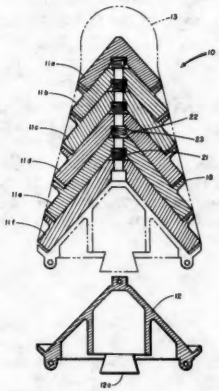
7. A chaff dispensing pod device for dispensing chaff deep

into the atmosphere while re-entering at hypersonic velocity, comprising:

a plurality of releasably interconnected pod segments,

multiple chaff bundles contained within each of said pod segments,

means for sequentially dispensing said chaff bundles from each of said pod segments,



and programming means for actuating the chaff bundle-dispensing means of one of said pod segments, for releasing and ejecting from the pod device said one of said pod segments and each subsequent pod segment as it becomes fully expended of the chaff bundles therein contained, and for actuating the chaff bundle-dispensing means of another of the plurality of pod segments upon the release and ejection of any of said pod segments, until all the pod segments have been expended.

4,597,333

TWO-PART ARMOR-PIERCING PROJECTILE

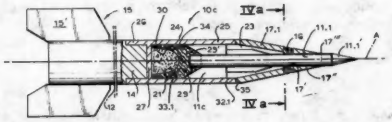
Jürgen Böcker, Oberhausen, and Peter Wallow, Düsseldorf, both of Fed. Rep. of Germany, assignors to Rheinmetall G.m.b.H., Düsseldorf, Fed. Rep. of Germany

Filed Jul. 9, 1984, Ser. No. 628,753

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1983, 3324681

Int. Cl.[4] F42B *13/06*

U.S. Cl. 102—518 **14 Claims**



1. A composite armor-piercing projectile comprising:

a front projectile part generally centered on an axis;

a cylindrical sleeve of predetermined outer diameter and also generally centered on the axis, the sleeve having

a front tube centered on the axis and at least partially containing the front part,

a rear tube also centered on the axis and extending axially rearward from the front tube, and

a crosswise partition separating the tubes; a guide in the front tube;

a drive plug axially slidable in the guide of the front tube and carrying the front part;

a rear projectile part centered on the axis, having a cylindrical outer surface substantially corresponding to the outer diameter of the sleeve, and having a forwardly extending projection fitting complementarily within the rear tube of the sleeve, the front projectile part having a smaller diameter than the rear projectile part;

a first explosive charge in the sleeve between the front and rear parts; and

detonator means for exploding the first charge and pushing the front part and the plug axially forward in the guide of the front tube away from the rear part.

4,597,334

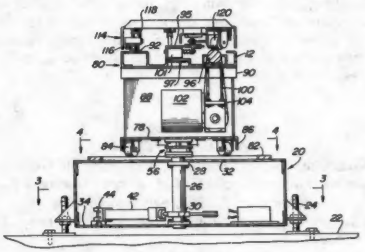
TURNTABLE FOR A SYSTEM OF DRIVERLESS VEHICLES

Charles E. Jacoby, Bethlehem, Pa., assignor to SI Handling Systems, Inc., Easton, Pa.

Filed Dec. 7, 1981, Ser. No. 328,283

Int. Cl.[4] B61J *1/00*

U.S. Cl. 104—37 **10 Claims**



2. A driverless vehicle system comprising a T-junction having first and second aligned tracks spaced from one another by a gap and a third track terminating adjacent said gap, said third track being at an angle with respect to said first and second tracks, said tracks being at the same elevation, each track having a rail along one side and a drive shaft along an opposite side, a turntable in said gap for transferring vehicles from said third track to one of said first and second tracks and vice versa while also facilitating transfer of vehicles from said first track to said second track, said turntable having a track at the same elevation as said other tracks, the track on said turntable having a rail along one side and a drive shaft along an opposite side, mounting structure means for vertically adjusting said turntable so that the track on said turntable is at the same elevation as said other tracks, said turntable supporting a motor for rotating the drive shaft thereon about its longitudinal axis, said track on said turntable including a traffic control device for causing vehicles to stop at a predetermined location on the turntable, and motor means connected to a portion of said turntable for causing the turntable to pivot through an arc whereby its track is aligned with the first and second tracks in one position thereof and aligned with the third track in another position thereof.

4,597,335

TRACK FOR WELDING CARRIAGE AND LOCATOR APPARATUS THEREFOR

Clyde M. Slavens, P.O. Box 440,577, Houston, Tex. 77244

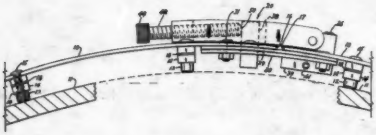
Filed Dec. 21, 1983, Ser. No. 563,993

Int. Cl.[4] E01B *25/08*; B23K *1/00*

U.S. Cl. 104—118 **10 Claims**

1. Track apparatus for travel of a carriage about a convexly curved object to do work on the convexly curved object, comprising a metal band of uniform width and of relatively small thickness and of a length to encircle said object when spaced at a uniform small distance therefrom, a plurality of circularly spaced crossbars each of uniform rectangular cross sections fixed transversely at the inner face of said band over

the length of said band, each said crossbar having a slot of uniform width at each end parallely of said inner face of said band, each said crossbar having portions inward of said slots, towards said curved object, which are of uniform thickness and are resilient with respect to the remainder of the crossbar and the outward resilient movement thereof being limited by the width of said slot, said portions inward of said slots each



having an inwardly protruding object engagement element affixed thereto to move therewith, latch means at the ends of said band for mutually fixing said band ends together and for driving said band ends one toward the other to tension said band to draw said engagement elements firmly against said convexly curved object whereby said band is securely fixed about said object.

4,597,336

ACTIVE SWITCH

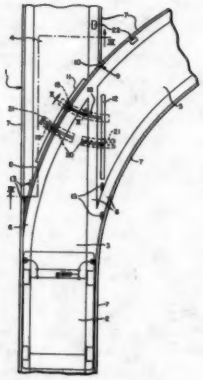
Hans-Joachim Förster, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz AG, Fed. Rep. of Germany

Filed Dec. 5, 1983, Ser. No. 558,008

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1982, 3244974

Int. Cl.[4] E01B *26/00*

U.S. Cl. 104—130 **15 Claims**



1. An active switch for the interaction area of tracks with horizontal wheel running surfaces and with substantially vertical transverse guide web means, arranged to project on both sides, for mechanically transversely guided vehicles, comprising an intersection area of a track bifurcation coming from a common track or a track junction entering a commom track, the transverse guide web means which delimit the intersection area of the tracks on the outside being immovable and running throughout the intersection area without interruption, further comprising a single switch tongue means being the only adjustable vehicle guiding switch member and being pivotable about a fixed bearing at the branch point of the intersection and a free end of the switch tongue means pointing in the direction toward the common track, and said switch tongue means being elastically bendable by lateral guide devices of a vehicle and having an approximately constant bending stiffness along its length, and fixed abutment means within the area of intersection between the wheel running surfaces, said abutment means determining the contour of the switch tongue means when pressed thereagainst in its respective end position, wherein, within the intersection area of the track extending from the branch point to a point where the free end of the tongue means comes in contact with the transverse guide web means of the common track, the full vertical extent of guide elements on both sides of the vehicle come in contact with either the transverse guide web means or the switch tongue means respectively.

4,597,337

LOW PROFILE INTERMODAL TRANSPORT SYSTEM

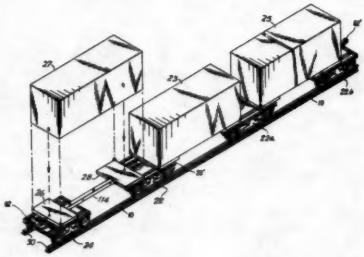
Elwood Willetts, 102 S. Pentaquit Ave., Bay Shore, L.I., N.Y. 11707

Continuation-in-part of Ser. No. 567,967, Dec. 23, 1983, which is a continuation of Ser. No. 390,533, Jun. 21, 1982, abandoned.

This application May 25, 1984, Ser. No. 614,741

Int. Cl.[4] B61D *17/00*; B61F *3/00*

U.S. Cl. 105—4 R **8 Claims**



1. In a rail train comprising the combination of a plurality of rail trucks having respective main frames, spring means for mounting said frames on rail wheel supported axles, journal means disposed on the ends of said axles, said spring means being interposed between said main frames and said journal means, centerplates each with a respective vertically extending king pin supported on said trucks and draft cradle means for interconnecting respective centerplates of separate rail trucks through their respective king pins and for securing cargo loads thereon;

the improvement comprising:

crank means for mounting at least one of said centerplates on a main frame of at least one of said rail trucks, said crank means including torsion means between said centerplate and said main frame for absorbing draft and slack start forces in said train.

4,597,338

PALLET

Elsmer W. Kreeger, Howell, Mich., assignor to Pinckney Molded Plastics, Inc., Howell, Mich.

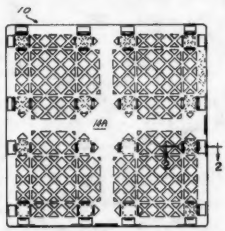
Filed Nov. 14, 1984, Ser. No. 671,316

Int. Cl.[4] B65D *19/18*

U.S. Cl. 108—51.1 **2 Claims**

1. A pallet comprising a pair of like half pallet members coupled to each other in opposed, face-to-face relationship, each of said members comprising a rigid, horizontally disposed, rectangular main panel; a plurality of support posts and a like plurality of latching leg assemblies integral with and projecting vertically from the inner side surface of the main panel with the latching leg assemblies of one of said members being received within the support posts of the other member, the distal ends of the posts of one member being engaged with the inner surface of the main panel of the other member to maintain said main panels of the two members in a predeter-

mined spaced relationship to each other; each of said posts being of like, square, tubular, horizontal cross section, each post having a generally rectangular opening through two opposed walls thereof adjacent the juncture of the post with its main panel, each latching leg assembly including a pair of flexible opposed legs received between the two opposed walls of the associated post; latch teeth on the outer side of each of said legs projecting into the rectangular opening of the associated post; a pair of corner skirts projecting vertically inwardly from said main panel at each end of each side of the panel and



a central skirt portion projecting vertically inwardly from said main panel centrally of each side of the panel in spaced relationship to the adjacent corner skirts, said skirts of the respective members being in edge-to-edge engagement with each other with the spacing between said corner skirts and central skirts defining a pair of forklift tine receiving openings in each side of said pallet; and tabs integral with and projecting vertically from the inner sides of said central skirts on two adjacent sides of each member engaged with the inner sides of the central skirts of the other member.

4,597,339

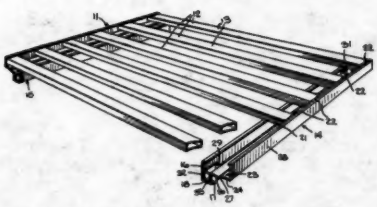
PALLET

Hugh McCaffrey, 534 Fourth St., Encinidas, Calif. 92024; Paul Scheibe, P.O. Box 1809, Rancho Santa Fe, Calif. 92067, and Bruce A. Spear, 597 S. Sierra #59, Solana Beach, Calif. 92075

Continuation of Ser. No. 368,103, Apr. 14, 1982, abandoned. This application Jan. 23, 1985, Ser. No. 694,155

Int. Cl.[4] B65D *19/00*; **A63G** *21/00*

U.S. Cl. 108—51.1 **12 Claims**



1. A pallet comprising:

a plurality of spaced apart hollow steel tubes comprising first, intermediate, and last tubes substantially parallel to each other and defining a substantially flat deck plane, wherein the length of the tubes define the width of the pallet and the distance between the first and the last of the plurality of tubes define the length of the pallet; and

first and second sheet steel support members substantially perpendicular to the tubes, each of said support members comprising a portion of U-shaped cross-section that extends the length of the pallet and that has a bight portion that forms a foot, and first and second sides, the first side being welded to the tubes at a location spaced inwardly from one end region of the respective tubes, the second side having an extended portion bent outwardly, wherein said extended portion comprises first and second horizontal portions vertically offset from each other by an integral web portion spaced horizontally outward from said second side and extending the length of the pallet with said first and second horizontal portions and said web portion all being integrally formed from said extended portion; wherein,

said second horizontal portion is outward of said web portion defining a roller contact area, and with the edge of the extended portion of the second side being welded to said one end region of the respective tubes; and wherein,

said web portion defines guide member means spaced horizontally outward from said second side by said first horizontal portion and positioned inward from said second horizontal portion defining said roller contact area, whereby the pallet will accurately follow a rail system comprising a plurality of aligned rollers.

4,597,340

SECURE CONTAINER

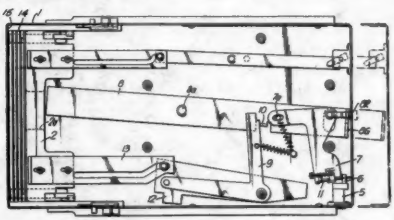
Ralph E. Huckle, West Sussex, England, assignor to De La Rue Systems Limited, Portsmouth, England

Filed Nov. 17, 1983, Ser. No. 552,963

Claims priority, application United Kingdom, Nov. 19, 1982, 8233107

Int. Cl.[4] E05G *1/00*; **B65H** *1/08*

U.S. Cl. 109—45 **12 Claims**



1. A secure container with a shutter for controlling access through an aperture to the contents of the container, and comprising:

a shutter-operating member coupled to the shutter and mounted for sliding motion in the container such that insertion of the container into a complementary housing causes the shutter-operating member to move within the container and open the shutter, the shutter operating member being formed with an aperature;

shutter locking means including a shutter locking bar mounted for pivotal movement between a primed position, in which one end of the shutter locking bar is aligned with the aperture in the shutter-operating member so as to allow the shutter operating member to slide down the shutter locking bar and open the shutter, and a locking position in which the said end of the shutter locking bar is out of alignment with the said aperture and prevents sliding movement of the shutter-operating member;

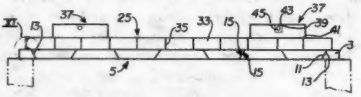
a lock with a lock pin cooperating with the shutter locking bar and movable between normal and priming positions, movement of the lock pin to the priming position causing the shutter locking bar to move to its primed position;

and an interlocking mechanism comprising a first part engaged by the lock pin when the lock pin is in its normal position and a second part connected to the first part and engaging the shutter locking means to prevent the movement of the shutter locking bar to its primed position when the first part is engaged by the lock pin.

4,597,341
SOAKING PIT COVER

Paul V. Suey, 1043 Blackforest Rd., Pittsburgh, Pa. 15235

Filed May 22, 1985, Ser. No. 736,670
Int. Cl.[4] F23M 7/00
U.S. Cl. 110—173 A 9 Claims



1. A soaking pit cover comprising a rectangular structural steel frame comprised of spaced intersecting sections, with rim sections defining a rectangle of a length and width to extend across the area of a soaking pit and project over the side and end walls of the soaking pit, containing:

a continuous panel of lightweight, high temperature heat-insulating refractory modules suspended from the structural steel frame over an area substantially coextensive with the area of the soaking pit defined by said side and end walls;

said panel formed from modules of trapezoidal crosssection lengthwise and crosswise, the sloping side and end edges of the trapezoidal, respectively, being equal with each other and with the edges of the side and end walls, respectively, of the other modules whereby the modules each have one face, of a wider and larger area, respectively, than the other;

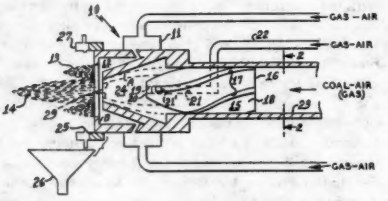
the modules of the panel being arranged in rows crosswise and lengthwise of the structural frame dovetailing with its adjacent blocks, with the modules in alternate rows being wide-face-up and wide-face-down, and in the intervening rows being reversed;

the wide-face-down modules having metal hardware integrated with the body of the modules by means of which they are connected with and suspended from the underside of said steel frame, the wide-face-up modules being suspended at least in part between and supported in place by their dovetail intermesh with the wide-face-down modules.

4,597,342
METHOD AND APPARATUS OF GAS-COAL COMBUSTION IN STEAM BOILERS

Alex E. S. Green, Gainesville, and Bruce A. S. Green, Micanopy, both of Fla., assignors to University of Florida, Gainesville, Fla.

Continuation of Ser. No. 500,393, Jun. 2, 1983, abandoned, which is a division of Ser. No. 306,177, Sep. 28, 1981, abandoned. This application Dec. 7, 1984, Ser. No. 679,448
Int. Cl.[4] F23D 1/00
U.S. Cl. 110—347 19 Claims



1. A method of combustion of coal-fluid mixture with combustible gas-air mixture in a combustion device comprising the sequential steps of:

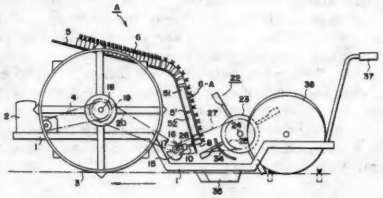
(A) introducing a hollow sheath of coal-fluid mixture into a chamber in a combustion device while simultaneously spirally swirling the sheath in a predetermined direction and maintaining the sheath in an organic relationship; and

(B) introducing a spirally swirling and organized combustible gas-air mixture internally within the hollow sheath with the motion of the combustible gas-air mixture being in the same swirling direction as the predetermined direction of the coal-fluid mixture to minimize any general mixing of the combustible gas-air mixture with the coal-fluid mixture and to promote volatilization and enhance the more complete combustion of the coal-fluid mixture by the combustible gas-air mixture to produce a flame by inwardly igniting the gas-air mixture within the hollow sheath of coal-fluid mixture.

4,597,343
CONTINUOUS PAPER-TUBE POTTED-SEEDLINGS SEPARATION TRANSPLANTING PLANTING MACHINE

Tetsuo Nambu, Obihiro, Japan, assignor to Nippon Tensaiseito Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 4, 1983, Ser. No. 463,839
Claims priority, application Japan, Feb. 9, 1982, 57-18279; Jun. 7, 1982, 57-96195
Int. Cl.[4] A01C 11/02
U.S. Cl. 111—2 10 Claims



1. A transplanting machine in which continuous paper tube pot assembly potted seedlings are drawn out in a row and the row of continous potted seedlings is separated into individual potted seedlings to be planted in a given field, said machine comprising:

a stopper mechanism for intermittently stopping the drawing out of the row of continuous paper tube potted seedlings and

a rotary transplating rod assembly having means for clasping a forwardmost one of the row of continuous paper tube potted seedlings, said rod assembly positively drawing out and separating a forwardmost potted seedling from said row in cooperation with said stopper mechanism to plant the separated potted seedling in the field.

4,597,344
METHOD OF OPERATING A SEWING MACHINE, ESPECIALLY A MULTI-NEEDLE SEWING MACHINE, AND AN ARRANGEMENT FOR PERFORMING THE METHOD

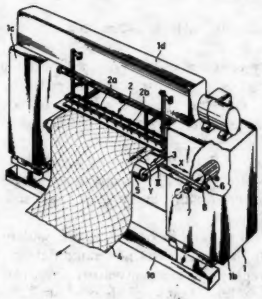
Klaus Stutznäcker, Frechen-Königsdorf, Fed. Rep. of Germany, assignor to Naehmaschinenfabrik Emil Stutznaecker GmbH & Co, KG, Cologne, Fed. Rep. of Germany

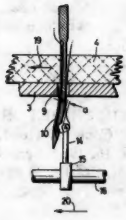
Filed Jan. 7, 1985, Ser. No. 689,556
Claims priority, application Fed. Rep. of Germany, Jan. 5, 1984, 3400206
Int. Cl.[4] D05B 97/00, 55/06
U.S. Cl. 112—262.3 14 Claims

1. A method of operating a sewing machine, especially a multi-needle sewing machine, in which the material to be sewn is advanced in any desired direction in a sewing plane delimited by a support, the respective needle is mounted on a needle holding arrangement and in operation moves with the thread substantially normal to the sewing plane through the material to a region situated beyond the latter, being deviated from its

initial course by the action of the material thereon as the latter advances during the sewing stroke, and a gripper associated with the needle is mounted on a gripper holding arrangement for angular displacement along a displacement plane substantially normal to the sewing plane into and out of the region to engage the thread thereat, at least one of the holding means being mounted on the support for movement relative thereto along the sewing plane, comprising the steps of moving the one holding means along the sewing plane, and so controlling the movement of the one holding means during the moving step and while the needle performs its sewing stroke in dependence on the needle deviation that the distance between the needle and the displacement plane of the gripper remains substantially constant in the course of the sewing stroke.

6. A moving arrangement for use in a sewing machine, especially a multi-needle sewing machine, in which the material to be sewn is advanced in any desired direction in a sewing plane delimited by a support, the respective needle is mounted





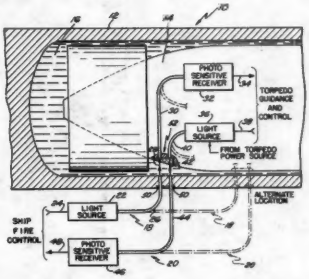
on a needle holding arrangement and in use moves with the thread substantially normal to the sewing plane through the material to a region situated beyond the latter, being deviated from its initial course by the action of the material thereon as the latter advances during the sewing stroke, and a gripper associated with the needle is mounted on a gripper holding arrangement for angular displacement along a displacement plane substantially normal to the sewing plane into and out of the region to engage the thread thereat, at least one of the holding arrangements being mounted on the support for movement relative thereto at least parallel to the sewing plane, comprising means for moving the one holding means along the sewing plane; and means for so controlling the operation of said moving means in dependence on the extent of the needle deviation as the needle performs its sewing stroke that the distance between the needle and the displacement plane of the gripper remains substantially constant in the course of the sewing stroke.

4,597,345

TORPEDO CABLELESS UMBILICAL

Floyd H. Reeser, Centre Hall, and Francis G. Quinn, State College, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 29, 1984, Ser. No. 665,586
Int. Cl.[4] F42B *19/00*
U.S. Cl. 114—20 R **3 Claims**



1. A system for providing high bandwidth communications between a ship fire control system and a guidance and control system of a torpedo loaded in a launch tube, the cavity therebetween being flooded with sea water, comprising:

at least transmit channel, connected to said ship and to said torpedo, for transmitting data from said ship to said torpedo, said at least one transmit channel further comprising, a first light source means, located aboard said ship, for producing a first light beam modulated in proportion to an electrical signal from said ship fire control system, a first optical transmit fiber, attached to said first light source and to said launch tube, for receiving and transmitting said first light beam across said cavity through said sea water, a first optical receive fiber, attached to the hull of said torpedo, for receiving said first freely propagating light beam incident upon said first receive fiber and transmitting said first beam, and a first photosensitive receiver means, connected to said first receive fiber, for receiving said first beam from said first receive fiber, converting the modulated light signal to a proportional electrical signal and transmitting said electrical signal to said torpedo guidance and control system; and

at least one receive channel, connected to said ship and to said torpedo, for transmitting return data from said torpedo to said ship.

4,597,346

NON-CONDUCTING MAST FOR SAILBOATS

Jerry B. Pollard, San Clemente, Calif., assignor to The Coleman Company, Inc., Wichita, Kans.

Filed Mar. 14, 1984, Ser. No. 589,511
Int. Cl.[4] B63H *9/10*
U.S. Cl. 114—39 **8 Claims**

1. A sailboat mast comprising an elongated lower metal portion and an elongated composite upper portion extending essentially to the top of the mast, the composite upper portion comprising a longitudinally extending plastic core and at least one continuous layer of resin-impregnated glass fibers surrounding the core, the plastic core including a plurality of

stepped portions which increase the thickness of the core as the core proceeds away from the lower metal portion, each

stepped portion having a plurality of layers of resin-impregnated glass fibers wrapped therearound.

4,597,347

ROLLER BOOM REEFING AND HOISTING OF A SAIL

George Spanopoulos, 44 Cumberland Court, London, England (W1 GB)

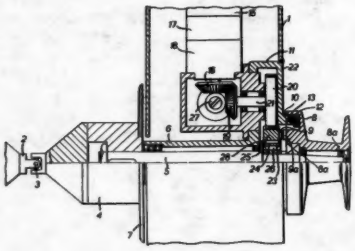
PCT No. PCT/GB83/00305, § 371 Date Jul. 19, 1984, § 102(e) Date Jul. 19, 1984, PCT Pub. No. WO84/02114, PCT Pub. Date Jun. 7, 1984

PCT Filed Nov. 28, 1983, Ser. No. 634,018

Claims priority, application United Kingdom, Nov. 29, 1982, 8233941

Int. Cl.[4] B63H *9/10*

U.S. Cl. 114—106 13 Claims



7. Mechanism for hoisting and reefing a sail on a sailing vessel wherein the foot of the sail is connected along its length to a roller boom, and wherein the hoisting and reefing of the said sail is effected by a rope used as halyard passing over a pulley at the upper part of a mast and connected at one of its ends to a hoisting drum and the other end to a reefing drum with the luff of the sail being connected alongside the rope upwards to the reefing drum, wherein the said reefing drum is connected with the roller boom via a universal joint whreby the boom is rotatable with the said reefing drum, characterized in that there are provided:

(a) rotatable coupling means for selectively rotating the said hoisting drum and the said reefing drum;

(b) engaging and locking means for selectively engaging the said coupling to the said hoisting drum or the said reefing drum, and automatically to lock the said hoisting drum with the said reefing drum at the end of a hoisting operation and to unlock the said drums at the start of a reefing operation; and

(c) brake means for providing a braking force on the hoisting drum during a reefing operation whereby the winding of the sail around the reefing drum and the boom is improved.

4,597,348

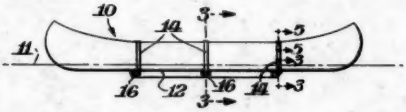
DETACHABLE KEEL FOR SMALL BOATS

Otakar Jonas, 1113 Faun Rd., Wilmington, Del. 19803

Filed Jun. 10, 1985, Ser. No. 742,879

Int. Cl.[4] B63B *41/00*

U.S. Cl. 114—140 5 Claims



1. A keel assembly for installation on a canoe having a gunwale comprising:

(a) two or more straps each having a first and a second flat side and means for securing said straps to the gunwale of said canoe, said straps being of a length to pass athwart the bottom of the canoe with the first flat side against the canoe;

(b) on the second flat side of each of said straps, one or more keels consisting of flexible bands, their longest dimension oriented longitudinally, and crossing said straps at edge at about a right angle;

(c) at each crossing a flexible bracket, said bracket being attached to the keel and to the second flat side of the strap, so as to deploy the keel outwardly from the strap at the point of attachment, at an angle of about 45° to 90° and to permit said flexible bracket to yield on collision with an underwater object, the straps of (a) being so attached to the gunwale as to permit displacement of one end of the keel of (b) whereby to bend said flexible keel so as to counteract freeboard windage and unsymmetrical thrust from a single paddle.

4,597,349

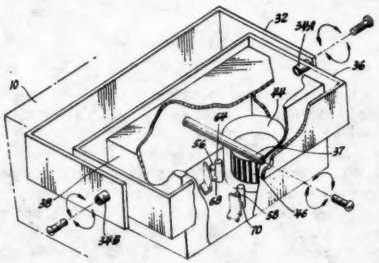
AUTOMATIC PILOT FOR SAILBOAT

James W. Dolfi, 19771 Cooley, Detroit, Mich. 48219

Filed Jun. 16, 1983, Ser. No. 504,962

Int. Cl.[4] B63H *25/02*

U.S. Cl. 114—144 A 7 Claims



1. A control unit for an automatic steering apparatus, comprising:

a base;

a steering actuator mounted on the base;

a support;

gimbal means mounted on the base and supporting the support;

a housng mounted on the support, the housing having trans-

parent means on at least a partially cylindrical surface for transmitting light therethrough, and including dampening fluid in the housing;

a compass member rotatably disposed in the housng in a predetermined position with respect to the earth;

a drum having a cylindrical surface, the drum being disposed in the dampening fluid in the housing and being connected to the compass member so as to be rotatable therewith about a vertical axis of rotation in a first direction;

a plurality of reflective first stripes disposed around the cylindrical surface of the drum, parallel to one another but not parallel to said first direction, each of said first stripes having a predetermined, substantially identical width in said first direction;

second stripes of a lesser reflectivity than said first stripes, the second stripes having a substantially identical width and being disposed between the first stripes so as to define a plurality of parallel, substantially linear marginal edges between the first stripes and the second stripes;

first light source means for delivering a light ray through the transparent means on the housing toward said first and second stripes on the drum;

first light detector means for detecting light reflected from the drum transmitted from the first light source means, the first light source means and the first light detector means being mounted on the support outside the housing;

second light source means for delivering a light ray through the transparent means on the housng toward said first and second stripes on the drum;

second light detector means for detecting light reflected from the drum transmitted from the second light source means, the second light source means and the second light detector means being mounted on the support outside the housing;

an elongated first lens mounted on the support between the first light source means and the drum, the longitudinal axis of the first lens being disposed generally parallel to the linear marginal edges on the drum to form a light ray received from the first light source means into a first focal line on the drum, parallel to said marginal edges;

an elongated second lens mounted on the support betwen the second light source means and the drum, the longitudinal axis of the second lens being disposed generally parallel to the linear marginal edges on the drum to form a light ray received from the second light source means into a second focal line on the drum, parallel to said marginal edges;

the first light detector means being disposed on the support so as to be operative to detect the marginal edge separating one of said first stripes from a neighboring second stripe passing the first focal line at such times as the second light detector means detects the second focal line being reflected from a non-marginal portion of one of said stripes; and

electronic means connected to the first light detector means and the second light detector means for transmitting a compensating steering signal to the steering actuator in response to relative motion between the marginal edges on the drum and said first focal line and said second focal line.

4,597,350

MOORING SYSTEM AND LIQUID CARGO TRANSFER FACILITY FOR ICE INFESTED WATERS

George E. Mott, Metairie, La., assignor to Texaco Inc., White Plains, N.Y.

Filed Jan. 16, 1985, Ser. No. 691,820
Int. Cl.[4] B63B *35/10*
U.S. Cl. 114—230 **4 Claims**

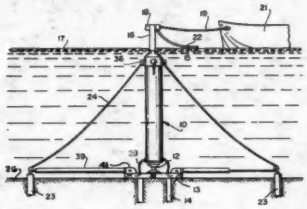
1. In an offshore installation for mooring a marine vessel during an on or offloading operation in a body of water that is subjected to floating ice,

a foundation base (13) supported on the floor of said body of water and having a pivotal connector (12) depending therefrom,

a mast (10) having a lower end thereof operably engaged to said pivotal connector (12) and being supported in a generally vertical disposition,

a tension cap (15) at said mast (10) upper end and including; a ring (32) fixed to the mast, and a column (16) extending upwardly therefrom to a point beyond the water's surface,

a plurality of anchors (23) spaced outwardly from said foundation (13), being embedded in the floor of said offshore body of water, and including pulley means (38) thereon,



cable take-up means (41) positioned on said foundation base (13), and

a plurality of cable means (24) connected at one end thereof to said tension cap (15), being registered in said pulley means (38), and being operably engaged to said cable take-up means (41),

whereby said cable means (24) are selectively adjustable to apply a directional force to said tension cap (15) in response to displacement of the mast (10) from a vertical disposition when the mast upper end is subjected to a lateral displacing force.

4,597,351

ACCUMULATOR

Edward C. Brainard, II, Marion, Mass., assignor to ENDECO-Environmental Devices Corp., Marion, Mass.

Continuation of Ser. No. 293,676, Aug. 17, 1981, abandoned.
This application Jun. 24, 1983, Ser. No. 507,946
Int. Cl.[4] A63C *15/06*
U.S. Cl. 114—230 **10 Claims**

1. Accumulator comprising:

an extensible, resilient core element having a relaxed state and a stretched state;

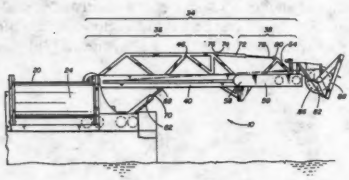
a braided covering comprising strands of relatively inextensible material having a high tensile strength loosely surrounding said core element in its relaxed state and coming into tension only when said core element is in its stretched state; and

means for seizing said covering to said core element at a plurality of intervals intermediate the seizing at the ends along the length of said core element, whereby said braided covering will carry the full load applied to said accumulator when it is in its stretched state.

4,597,352
COMPACT TOWING SYSTEM FOR UNDERWATER BODIES

Robert S. Norminton, R.R. 3, 10770 Willoughby Drive, Niagara Falls, Ontario, Canada (L2E 6S6)

Filed Aug. 25, 1983, Ser. No. 526,537
Int. Cl.[4] B63B *21/66*
U.S. Cl. 114—254 140 Claims



1. A compact towing system adapted to be mounted on a ship for towing an underwater towed body using faired tow cable, comprising:

(a) a trucked gantry adapted to be driven in a fore and aft direction;

(b) a lower saddle adapted to be disposed inside the confines of said trucked gantry when said gantry is driven aft;

(c) a winch drum with fixed foundations and with the centre-line thereof extending approximately fore and aft along said ship;

(d) a boom having an inner end and an outer end, said inner end being hinged on a hollow pivot on said trucked gantry;

(e) a pivotable deflection sheave mounted inside said boom, the pitch radius of said sheave being tangent to the center-line of said hollow pivot;

(f) a fairlead sheave and saddle assembly, said assembly being mounted on a carriage which is adapted to be driven along said boom;

(g) means for driving said trucked gantry in synchronism with said winch drum, (b) that, as said trucked gantry traverses between a forward stow position and an aft full cable-out position, a zero degree fleet angle is obtained between said tow cable and said winch drum;

(h) means for driving said drum carriage to traverse said carriage along said boom only during launch and recovery in synchronism with said winch drum so that, as said cable unwinds, said carriage is driven towards the outer end of said boom, so that said fairlead sheave and saddle assembly overhangs said outer end of said boom, and as said cable winds, said carriage is driven towards the inner end of said boom, so that said fairlead sheave and saddle assembly lies along said boom; whereby

(i) in operation, said cable passes from said winch drum, through a fairing training device, through said hollow boom pivot, around said deflection sheave, along said boom, though said fairlead sheave which is mounted on said driven carriage and thence to said towed body.

4,597,353
AMPHIBIAN VEHICLE

Masatsugu Takezono, Tokyo, Japan, assignor to Teiemu Giken Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 2, 1984, Ser. No. 657,015
Claims priority, application Japan, Nov. 28, 1983, 58-183364[U]; Dec. 7, 1983, 58-188160[U]; Dec. 9, 1983, 58-190232[U]; Feb. 17, 1984, 59-21432[U]; May 16, 1984, 59-70435[U]; May 23, 1984, 59-75614[U]; May 23, 1984, 59-103804
Int. Cl.[4] B63B *35/86*
U.S. Cl. 114—270 9 Claims

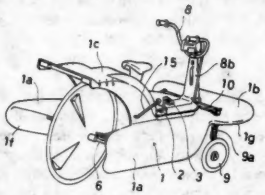
1. An amphibian vehicle comprising:

a front wheel, which can be controlled in direction by operation of a handle, provided at a front portion of a body having float members therearound;

a drive shaft, adapted to be rotated by driving means, disposed at a rear portion of said body and in a direction perpendicular to a direction of movement of said body;

a wheel supported for rotation on said drive shaft; and

changing over means for changing over said wheel between a perpendicular position and an oblique position relative to said drive shaft, said changing over means including an



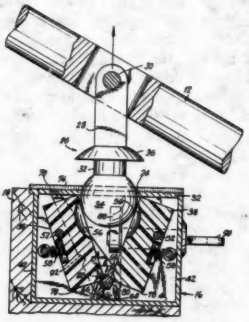
elongated hole formed in a central portion of said wheel and a guide member in the form of a wedge which is moved along said drive shaft into and out of said elongated hole in response to the operation of an operating lever;

such that, during running on land of said amphibian vehicle, said wheel may be directed perpendicularly to said drive shaft, and during running on the water, said wheel may be directed obliquely to said drive shaft.

4,597,354
COUPLING SYSTEM WITH LOCK

Jerome D. Gelula, 535 E. 86th St., New York, N.Y. 10028

Filed Jun. 29, 1984, Ser. No. 626,558
Int. Cl.[4] B63B *17/00, 21/04;* B63H *16/06*
U.S. Cl. 114—343 13 Claims



1. An improved latching system, comprising, in combination,

a supporting structure,

a pair of capture members forming generally facing hollow portions, said capture members being supported for movement between capturing and releasing positions by said supporting structure,

first spring means carried by said support structure normally biasing said capture members towards said releasing position,

an elongated cam member positioned between the lower portions of said capture members and extending generally lateral to said pair of capture members, said cam member being supported for movement between interfering and non-interfering positions by said supporting structure, wherein in said interfering position said capture member is

in said capturing position and in said non-interfering position said capture member is in asid releasing position,

an elongated, generally upright lever member having one end connected to one end of said cam member and another end accessible to gripping by an operator, said lever member being carried by said supporting structure, said lever member being capable of movement between first and second positions wherein in said first position said cam member is in said interfering position and in said second position said cam member is in said non-interfering position,

second spring means carried by said supporting structure for normally biasing said lever member towards said first and second positions;

a ball member capable of being releasably captured in said hollow portions of said capture members, said ball member being capable of being fully rotated over 360 degrees,

a connector member having one end connected to said ball member and extending outwardly from said support structure, said connector member being rotatable over 360 degrees with said ball member,

a key lock member supported for rotational movement by said supporting structure,

a pawl member integral with said key lock capable of movement between holding and non-holding positions, wherein in said holding position said pawl member holds said lever member in said first position,

a key capable of being inserted into said key-lock member and operating said key lock member and said pawl member between said holding and non-holding positions, and

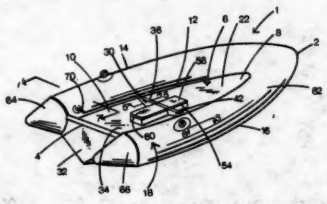
a boat having side walls wherein said supporting structure is positioned in one of said side walls, and further including a base structure, said supporting structure being positioned in said base structure.

4,597,355

FOLDING SEMI-RIGID INFLATABLE BOAT

Trevor Kirby, 6695 Nelson Avenue, Horseshoe Bay, West Vancouver, British Columbia, Canada (V7W 2B2)

Filed Sep. 28, 1984, Ser. No. 655,251
Int. Cl.[4] B63B *7/08*
U.S. Cl. 114—345 **17 Claims**



1. A folding, semi-rigid inflatable boat having a bow, a stern and gunwales and comprising:

(a) a hull portion having:

(i) a rigid bow half and a rigid stern half foldably connected by a transverse hinge means for permitting said halves to be folded and unfolded towards each other;

(ii) a top extending from said bow along opposite sides of the boat to said stern; and,

(b) an inflatable gunwale portion generally disposed above said top and extending rearwardly from said bow along opposite sides of the boat, said inflatable gunwale portion being watertightly connected to said top, and:

(i) in an inflated condition, providing flotation support and maintaining said hull portion in an unfolded condition; and,

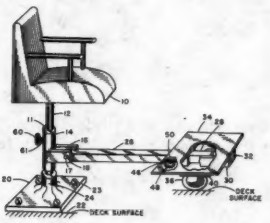
(ii) in a deflated condition, enabling said bow and stern halves to be folded towards each other along said transverse hinge.

4,597,356

BOAT MOTOR CONTROL PLATFORM FOR USE WITH FISHERMAN'S CHAIR

Charles P. McCaghren, 1802 5th Ave., SW., Decatur, Ala. 35601, and Jack A. Mullican, Rte. 3, Chapel Hill Rd., SW., Decatur, Ala. 35603

Filed Feb. 7, 1985, Ser. No. 699,410
Int. Cl.[4] B63B *17/00*
U.S. Cl. 114—363 **2 Claims**



1. The combination of a fisherman's chair and a platform for holding a boat motor control for use on the deck of a fishing boat and comprising;

a fisherman's chair having a supporting first sized pedestal of circular cross section extending downwardly from said chair;

a receiving means mounted securely on said deck for receiving and rotatably supporting said pedestal in a vertical position;

a first tubular shaped sleeve rotatably mountable around said pedestal and having a pair of parallel ear-like elements extending outwardly from and beyond the perimeter of said first sleeve;

an elongated first channel-like element secured at a first end to said ear-like elements in a manner to be vertically pivotal;

a horizontal platform having a substantially flat upper surface for mounting said motor control, an underside surface, and a second channel-like element secured on said underside surface with a cross sectional opening of a shape to slidably receive said first channel-like element;

means for securing said first channel-like element within said second channel-like element at desired locations; and

a pair of casters mounted on the underside surface of said platform to enable said platform to move in an arcuate path around said pedestal with the radius of said arcuate path being determined by the positioning of said first channel-like element within said second channel-like element.

4,597,357

BIRD FRIGHTENING DEVICES

David H. LeMessurier, 40 Bevington Road, Glenunga, South Australia, Australia 5064

Filed Nov. 9, 1984, Ser. No. 669,993
Claims priority, application Australia, Nov. 11, 1983, PG2345
Int. Cl.[4] A63H *3/00*; G09F *7/22*
U.S. Cl. 116—22 A **10 Claims**

1. A Bird Scare comprising a sheet of material having at least over a substantial portion of the surface a highly light reflective finish, and being of elongate shape which sheet is attached through a connector to a first side of a swivel, and a tie secured to a second side of the swivel, the attachment between the sheet and the swivel being at a narrower edge of the elongate shape of the sheet, the sheet including a shape providing a twist about an axis extending from the point of attachment in the elongate direction of the sheet, such twist being such as to induce rotation of the sheet in gently rising air when the sheet is freely hanging, the sheet shape further including a curved

edge portion when measured along a direction transverse to the said axis, such curved portion being such as to induce

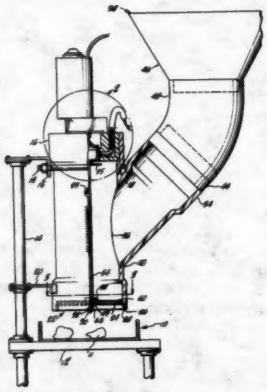
rotation of the sheet in light winds when such winds are directed in a substantially transverse direction to the said axis.

4,597,358

POWDER SIFTER AND DISPENSER

Edward R. Aitken, 2723 Walnut Grove, Rosemead, Calif. 91770

Filed Feb. 10, 1984, Ser. No. 579,156
Int. Cl.[4] B05C *19/00*
U.S. Cl. 118—24 12 Claims



1. An apparatus for metering, sifting and feeding a powder, the apparatus comprising:

(a) a main vertical duct with an outlet at its bottom;

(b) a downwardly slanted branch duct for feeding powder into the main duct, the branch duct intersecting the main duct between the top and the bottom of the main duct, the inlet of the slanted duct being above the intersection;

(c) a screen covering the outlet for sifting the powder;

(d) an agitator above the screen for agitating the fed powder to permit the powder to fall through the screen, the agitator comprising a plurality of broad fingers having co-planar top and bottom surfaces, the fingers being located near the screen without contacting the screen;

(e) a drive mounted above the agitator and the intersection for driving the agitator; and

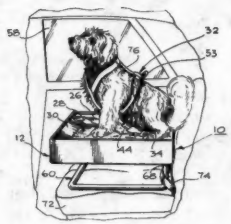
(f) a vertical shaft between the drive and the agitator.

4,597,359

VEHICLE SAFETY PLATFORM FOR PETS

Maurice D. Moorman, 8124 Holy Cross Pl., Los Angeles, Calif. 90045

Filed Jan. 14, 1985, Ser. No. 691,395
Int. Cl.[4] A01K *1/035*
U.S. Cl. 119—1 16 Claims



1. An improved vehicle safety platform for pets comprising, in combination:

an animal-supporting platform which is generally rectangular in horizontal outline and comprises a support platform substantially surrounded by an upraised rim with downwardly depending skirt portions joined to said support platform at said rim;

a base member connected to the underside of said platform in a region concealed by said skirt portions and supporting said platform in a generally horizontal position, said base member comprising a bracket having interconnected generally vertical and horizontal arms extending downwardly and forwardly underneath the platform to support the same, said generally vertical arm being disposed at about the rear of said platform, said horizontal arm being adapted to rest on the seat portion of a vehicle seat with said platform spaced above the seat near the level of a vehicle window; and

releasable pet tethering means anchored to the platform.

4,597,360

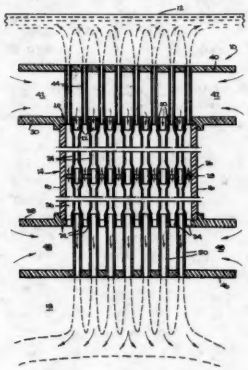
SALINITY DRIVEN OCEANOGRAPHIC UPWELLING

David H. Johnson, Lakewood, Colo., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 30, 1984, Ser. No. 645,650
Int. Cl.[4] A01K *61/00*
U.S. Cl. 119—3 23 Claims

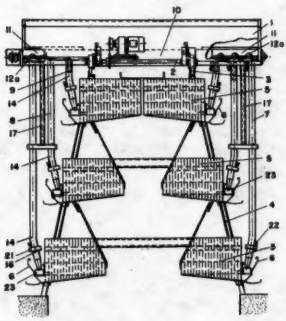
12. An upwelling device for mariculture comprising, a main duct having an elongated longitudinal wall portion, opposite end portions and a perforated cover plate at each opposite end portion, an interior space being defined in said main duct between said perforated cover plates, a plurality of elongated flow segregating members supported in the interior space of said main duct and each said flow segregating member having at least one end extending longitudinally beyond one of the perforated cover plates, a manifold plate for each end of said main duct, each said manifold plate being spaced a predetermined amount from respective said cover plates at each end portion of said main duct, at least one of said manifold plates

accommodating a longitudinally extending end of said flow segregating members, the predetermined space between each



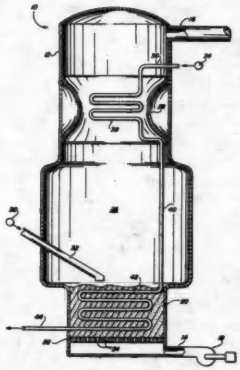
said manifold plate and a respective said cover plate defining respective fluid flow paths.

4,597,361
FEED PROPORTIONER
Manuel R. Tudela, Reus, Spain, assignor to USI Agri-Business Company Inc., New Holland, Pa.
Filed Mar. 1, 1984, Ser. No. 585,131
Int. Cl.[4] A01K *39/012*
U.S. Cl. 119—52 B **5 Claims**



1. Apparatus for dispensing fodder into an elongated fodder channel comprising a hopper for containing said fodder, at least one duct means operatively connected to said hopper and having a dispenser mouthpiece; means for conducting said fodder into said duct means whereby fodder is conducted downwardly through said duct means and mouthpiece into said channel; a shoe located at the end of said mouthpiece in said channel and adapted to slide inside and along said channel as said duct means, including said mouthpiece, is moved along said channel; said shoe comprising deflector means formed to provide an inclined surface spaced above the channel floor and located immediately below the mouthpiece for deflecting the fodder passing through and out of said mouthpiece; said deflector means also having wings spaced from each other longitudinally of said channel and extending downwardly to the floor of said channel and diagonally across said channel for containing said fodder; said wings having openings with adjustable gates for adjustably delivering the fodder into said channel.

4,597,362
FLUIDIZED BED COMBUSTOR
Howard C. Daudet, Phoenix, and Weldon D. Bagley, Tempe, both of Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.
Filed Sep. 5, 1984, Ser. No. 647,598
Int. Cl.[4] F22B *1/00*
U.S. Cl. 122—4 D **10 Claims**



1. A fluidized bed combustor, comprising:

a vertical housing;

a bed of granular, generally non-combustible material disposed in a lower portion of said housing;

means for delivering combustion air into said housing for upward flow through said bed to maintain said granular material in a fluidized state;

means for delivering fuel to said bed for combustion therein to generate heat;

heat exchanger means adapted to carry a cycle fluid and arranged in said housing for transferring heat of combustion to said cycle fluid, said heat exchanger means including first and second heat exchangers, said first heat exchanger immersed within said bed for promoting heat transfer primarily through solid-to-solid surface contact between said granular material and said first heat exchanger;

said housing having a portion with a relatively large horizontal cross-section extending vertically above said bed for maintaining a relatively low superficial vertical velocity of combustion effluent therein to optimize said heat transfer by solid-to-solid contact; and

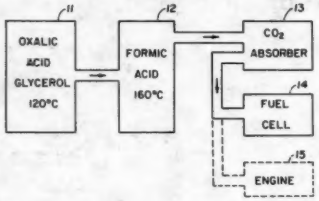
a venturi disposed above said portion of the housing for substantially increasing the velocity of combustion effluent passing therethrough without disturbing said low superficial velocity of effluent in said portion of the housing, said second heat exchanger disposed within said venturi and operable to transfer heat to said cycle fluid primarily by convection and radiation from the effluent gas to said heat exchanger, said venturi operable to maintain said effluent at a relatively high velocity at said second heat exchanger for prompting the heat transfer by convection and radiation said first and second heat exchangers being serially connected.

4,597,363

HYDROGEN GENERATOR FOR MOTOR VEHICLE

Melvin Emelock, 1748 NW. 72nd Ave., Plantation, Fla. 33313

Division of Ser. No. 238,934, Feb. 27, 1981, Pat. No. 4,376,097.
This application Apr. 20, 1983, Ser. No. 472,987
Int. Cl.[4] F02B *43/08*
U.S. Cl. 123—3 **2 Claims**



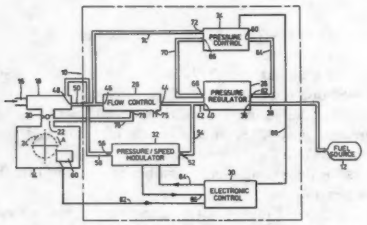
1. A method for generating electricity in situ comprising heating a dispersion of oxalic acid in liquid medium at about 120° C. to form formic acid, heating said formic acid at a temperature of about 160° C. to form hydrogen, and conducting said hydrogen to a fuel cell whereby electrical energy is formed or as fuel to an internal combustion engine.

4,597,364

FUEL CONTROL SYSTEM FOR GASEOUS FUELED ENGINES

Colin G. Young, Mississauga, Canada, assignor to Emco Wheaton International Limited, London, Canada

Division of Ser. No. 605,274, Apr. 30, 1984, Pat. No. 4,449,509.
This application Nov. 5, 1984, Ser. No. 668,009
Int. Cl.[4] F02B *3/00*
U.S. Cl. 123—27 GE **8 Claims**



4. In a diesel engine having a plurality of cylinders, each having associated therewith a diesel fuel input line and an air input through which a fresh charge of induction air is induced, a fuel pump communicating with each diesel fuel line for sequentially supplying fuel under pressure to each diesel fuel line in the required firing order, the improvement of a fuel control system for use in providing a timed supply of gaseous fuel from a high pressure source to each air input comprising:

(a) a flow control means associated with each air input, said flow control means being adapted to open to communicate with its associated air input to admit gaseous fuel to said air input and to close to interrupt communication with its associated air input, said flow control means comprising;

(I) a pressure regulator having an input for receiving pressurized gaseous fuel from a source and an output for discharging gaseous fuel, said pressure regulator being adapted to maintain a constant pressure in the discharging fuel for a given engine speed regardless of flow rate and to increase or decrease the pressure in the discharging gaseous fuel in response to an increase or decrease in engine speed,

(II) a first flow control valve having an input communicating with the output of said pressure regulator and a plurality of outputs,

(III) a second flow control valve associated one with each fresh air input and communicating with said first flow control valve, said second flow control valves each having a valve actuator member which communicates with said means which is indicative of engine loading conditions so as to be operable to control the flow of gaseous fuel from its output in response to engine loading conditions regardless of engine speed,

(IV) control means communicating with said engine for measuring the speed of the engine and generating a first signal which is indicative of the engine speed,

(V) modulator means communicating with the output from the pressure regulator to measure the pressure of the fuel supply to the flow control valve, said modulator also communicating with the control means to receive said first signal, said modulator means being adapted to compare the measured pressure with the measured speed and to generate a third signal which is indicate of an undesirably low pressure or a fourth signal which is indicative of an undesirably high pressure, said third or fourth signals being communicated to said control means,

(VI) pressure control means communicating with said pressure regulator to increase or decrease the pressure in the gaseous fuel output in response to the receipt of said third or fourth signals respectively,

(b) means for supplying gaseous fuel under pressure to each flow control means,

(c) means for determining when diesel fuel is being injected into each cylinder and generating a control signal which indicates when fuel injection occurs and communicates said control signal to the fuel control means associated with the cylinder which is next in the firing order to that receiving diesel fuel such that the control signal is effective to open said flow control to admit gasecus fuel to the input air of said cylinder which is next in firing order

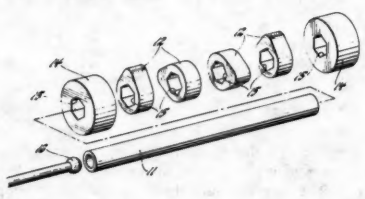
---

4,597,365

CAMSHAFT ASSEMBLY AND METHOD

Anthony J. Madaffer, Brighton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 7, 1985, Ser. No. 699,313
Int. Cl.[4] F01L *1/46*; F16H *53/00*; B23P *15/00*; B21D *39/00*
U.S. Cl. 123—90.6 **12 Claims**



7. A method of manufacturing a camshaft assembly for internal combustion engines and the like, said method including the steps of:

providing a plurality of cam and journal elements, said elements each including an axial opening,

securing said elements in predetermined fixed orientation and spacing with said openings aligned on a common axis,

inserting a hollow tube into said elements, in close fitting relation with said openings, and

expanding the hollow tube into mechanical interference engagement with all the element openings to secure the elements permanently onto the tube in said predetermined orientation while forming within the tube a uniform smooth sided interior cross-sectional configuration by

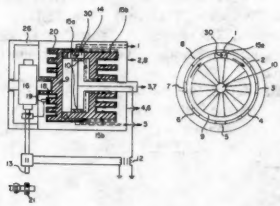
forcing through the tube an element sufficiently larger than the tube inner diameter to outwardly deform the tube wall in the required degree.

8. A camshaft assembly for internal combustion engines and the like, said assembly comprising a plurality of cam and journal elements each including an axial opening and secured in predetermined fixed orientation and spacing, with said openings aligned, on a hollow tube mechanically expanded into interference engagement with all the element openings while forming within the tube a uniform smooth sided interior cross-sectional configuration and having portions of the tube exterior between the elements expanded diametrically beyond the element openings to secure the elements permanently onto the tube in said predetermined orientation.

4,597,366
FIELD-INTERRUPTING CONTACTLESS IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Jack C. Chen, 120 Spruce St., Wood Dale, Ill. 60191

Filed Jul. 24, 1985, Ser. No. 758,317
Int. Cl.[4] F02P 1/00
U.S. Cl. 123—146.5 A 7 Claims



1. An apparatus for distributing a high voltage arc from the high voltage ignition coil electrode of an internal combustion engine to a plurality of spark plug electrode terminals, comprising:

a high voltage ignition coil electrode connected to a high voltage ignition coil means;

a plurality of spark plug electrode terminals directly opposing said high voltage ignition coil electrode;

said high voltage ignition coil electrode and said plurality of spark plug electrode terminals being in direct opposition to each other and separated from each other by a fixed gap;

a high resistance, field-interrupting dielectric device having opposed surfaces;

said high resistance, field-interrupting dielectric device having an aperture or hole therethrough passing between said opposing surfaces and defining a conductive path between said opposing surfaces;

a means for rotating said high resistance, field-interrupting dielectric device in said fixed gap between said high voltage ignition coil electrode and said plurality of spark plug electrode terminals, in such a manner that said aperture through said device passes directly between said opposing high voltage ignition coil electrode and said plurality of spark plug electrode terminals, allowing a high voltage arc from said high voltage ignition coil electrode to bridge said fixed gap through said aperture causing the respective spark plugs connected to the plurality of spark plug electrode terminals to be fired in the proper sequential manner;

a means for synchronizing the rotation of said high resistance, field-interrupting dielectric device in said fixed gap between said high voltage ignition coil electrode and said plurality of spark plug electrode terminals, with the rotation of the camshaft of said internal combustion engine, in such a manner so as to insure the proper sequential firing of said respective spark plugs.

4,597,367
ENGINE VALVE AND METHOD OF PRODUCING THE SAME

Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 4, 1983, Ser. No. 481,906
Claims priority, application Japan, Apr. 5, 1982, 57-49012[U]
Int. Cl.[4] F01L 3/02
U.S. Cl. 123—188 AA 14 Claims

1. An engine valve of an internal combustion engine, comprising:

a hollow tube member formed of a drawn steel tube, said hollow tube member having a central portion comprising a tubular body, and a first end part which is flared outwardly and includes an open end peripheral portion at the extreme end of said first end part, said hollow tube member tubular body constituting a valve stem section;

a generally disc-shaped lid member made of metal and having a peripheral portion integrally connected with the open end peripheral portion of said hollow tube member, said lid member and the first end part of said hollow tube member constituting a valve head section; and

a stem end member made of metal and integrally connected with a second end part of said hollow tube member;

a filler metal comprising stellite disposed in contact with the open end peripheral portion of said hollow tube member first end part and the peripheral portion of said disc-shaped lid member to secure together said hollow tube member and said lid member to thereby form said integral connection, said stellite filler metal being a wear and corrosion resistant nonferrous alloy, said filler metal being formed as a padding having a peripheral surface including a valve face for contacting a valve seat of an engine; and

a filling comprising an aluminum alloy containing silicon, said filling being disposed in said valve head section to fill said valve head section.

4,597,368
ENGINE IDLE SPEED CONTROL SYSTEM

Frank Ament, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 25, 1985, Ser. No. 705,143
Int. Cl.[4] F02M 59/20
U.S. Cl. 123—339 2 Claims

1. An idle speed control system for an internal combustion engine having a fuel delivery means for supplying fuel to the engine, the idle speed control system comprising in combination:

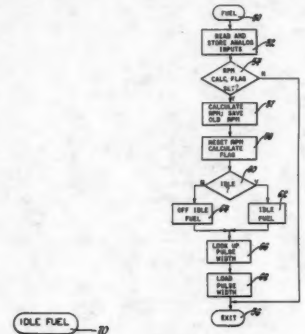
means for controlling the fuel delivery means to supply a scheduled idle fuel quantity during an idle operating state of the engine;

means for sensing the engine idle speed;

integrator means responsive to the engine idle speed and a desired engine idle speed for adjusting the scheduled idle

fuel quantity in direction and amount to cause correspondence between the engine idle speed and the desired engine idle speed, the integrator means adjustment being a measure of engine load conditions; and

means for establishing the scheduled idle fuel quantity, said means including (A) means for establishing a family of curves as a function of the amount of integrator adjustment of the secheduled idle fuel quantity, each curve of the family of curves representing idle fuel quantity as a function of engine idle speed for a respective engine load condition, and (B) means for selecting the curve corresponding to the integrator adjustment of the scheduled idle fuel quantity and providing the scheduled fuel quantity from the selected curve in accord with the sensed engine idle speed.

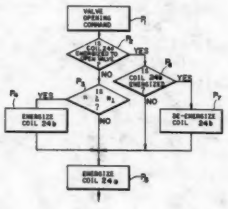


4,597,369

FUEL CUTOFF APPARATUS FOR FUEL INJECTION PUMP FOR DIESEL ENGINE

Seishi Yasuhara, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed May 21, 1982, Ser. No. 380,891
Claims priority, application Japan, May 25, 1981, 56-77982
Int. Cl.⁴ F02M *39/00*
U.S. Cl. 123—458 **19 Claims**



1. A fuel cutoff apparatus for a fuel injection pump in an internal combustion engine, comprising:

(a) a valve member movable to selectively open or block a port connecting a source of fuel to a fuel line;

(b) an electromagnetic coil means selectively energizable at a plurality of distinct energy levels to move said valve member to open or block the port; and

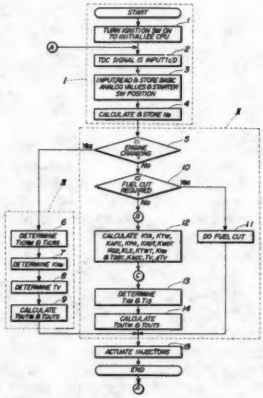
(c) a controller means for energizing said electromagnetic coil means to pen said port in response to a valve opening command by determining whether the energy level of said coil means is at an energy level causing said valve member to open or to block said port, said controller means being further operable for determining a characteristic of engine speed of said engine when said energy level of said coil means is determined to be at a level causing said valve member to block said port member, for providing a variable level of electrical current to said coil means as a function of said engine speed characteristic for opening said port, and for selecting the electrical current in accordance with said engine speed characteristic whereby said controller causes said valve member to open said port with efficient current utilization.

4,597,370

METHOD FOR CONTROLLING FUEL SUPPLY TO AN INTERNAL COMBUSTION ENGINE AFTER TERMINATION OF FUEL CUT

Akimasa Yasuoka, Tokyo, and Yutaka Otobe, Shiki, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 506,672, Jun. 22, 1983, Pat. No. 4,508,087. This application Sep. 5, 1984, Ser. No. 647,714
Claims priority, application Japan, Jun. 23, 1982, 57-107952
Int. Cl.⁴ F02D *41/10, 41/12*
U.S. Cl. 123—493 **14 Claims**


START
TURN IGNITION SW ON TO INITIALIZE CPU
TDC SIGNAL IS INPUT?
INPUT/READ & STORE BASIC ANALOG VALUES & STARTER SW POSITION
CALCULATE & STORE Ne
ENGINE CRANKING?
FUEL CUT REQUIRED?
DETERMINE TiCRE & TiCRE
DETERMINE Kne
DETERMINE Tv
CALCULATE TmFN & TmFS
CALCULATE Kne, KTw, KAPC, KTH, KWOT, KWOT, KBLKLS, KTWT, Kbe & TBAT, KAPC, Tv, ATV
DO FUEL CUT
DETERMINE Tmi & Tiq
CALCULATE TmTH & TmTS
ACTUATE INJECTORS
END

1. A method for controlling the quantity of fuel supply to an internal combustion engine, by increasing the fuel quantity in relation to a predetermined control signal generated with a predetermined constant pulse repetition period, after termination of a fuel cut operation comprising: detecting a transition of said engine from an operating condition wherein said fuel cut operation is effected to another operating condition wherein the fuel supply operation is effected; determining whether a variation in the rotational speed of said engine is larger than a predetermined value; and effecting said increase of the fuel quantity for a period of time after said transition has been detected and before a predetermined number of pulses of said predetermined control signal are generated, so long as it is determined said variation is larger than said predetermined value.

4,597,371

FUEL INJECTION APPARATUS FOR TWO-STROKE ENGINES

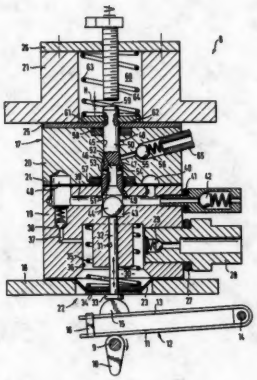
Michael Wissmann, Markgröningen, and Hans Nickel, Cottenweiler, both of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Feb. 21, 1985, Ser. No. 704,082

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1984, 3406120

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—495 22 Claims



1. Fuel injection apparatus for a two-stroke engine such as small engines for fast running work tools, the engine having a fuel tank and a crankshaft, the apparatus comprising:

a housing;

pressure chamber means formed in said housing for receiving fuel to be injected into the engine;

valve means for controlling the admission of fuel into said chamber;

a pump piston mounted in said housing for reciprocatory movement therein along a predetermined axis;

channel means formed in said pump piston for conducting fuel into said pressure chamber means;

valve means for opening and closing said channel means in dependency upon said movement of said pump piston; and,

actuating means for imparting said reciprocatory movement to said pump piston;

chamber means formed in said housing between said channel means and said actuating means;

said valve means including a valve seat formed on said piston at the inlet to said channel means; and, a free-flying sealing body disposed in said chamber means for movement into and out of contact engagement with said valve seat;

fuel supply means for supplying fuel to said channel means via said chamber means and said valve means; and,

said actuating means including cam means driven by the crankshaft of the engine and, cam follower means for transmitting the movement of said cam means to said sealing body for moving the latter into contact engagement with said valve seat.

4,597,372

OIL SEPARATOR FOR BLOWBY GAS

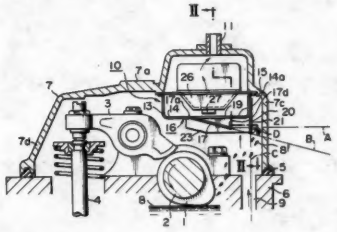
Yasuharu Furukawa, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jul. 10, 1985, Ser. No. 753,602

Claims priority, application Japan, Sep. 26, 1984, 59-199395

Int. Cl.[4] F02M *25/06*

U.S. Cl. 123—572 10 Claims



1. An oil separator for blowby gas in a multi-cylinder internal combustion engine having rotating cams, the oil separator comprising:

a baffle having a side wall and a bottom wall which extends from a lower edge of said side wall, a cut piece bent away from said bottom wall to form a hole in said bottom wall, said cut piece including one side connected to said bottom wall a slanting portion and an opposide side opposed to said one side and comprising an edge, said cut piece slanting toward a side wall of a cylinder head cover, a gap formed between a periphery of the hole formed in said bottom wall and the edge of said cut piece constituting a blowby gas suction port; and

an oil shut-off member attached to said baffle and having a first wall located at a spaced distance from and opposed to said edge of the cut piece of said baffle, a bottom end of said first wall being located between a first line extending from said edge of said cut piece and perpendicular to said first wall, and an intersection of an extension of said cut piece and an extension of said first wall.

4,597,373

IGNITION SYSTEM WITH SAFETY CIRCUIT

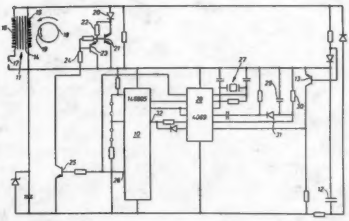
Bo C. Andreasson, Göteborg, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Dec. 7, 1984, Ser. No. 679,378

Claims priority, application Sweden, Dec. 20, 1983, 8307031

Int. Cl.[4] F02P *5/145, 11/00*

U.S. Cl. 123—630 4 Claims



1. In an ignition system for an i.c. engine with a magnetic system for generating ignition energy, an ignition coil, a spark plug connected to the secondary winding of the coil, the primary winding of the coil being connected to an ignition switch switchable by triggering, a detector connected to establish a reference time for every spark, a micro-computer with a static

memory, a timer, an oscillator, a comparator in which timer pulses and a reference code from the timer and memory respectively are brought into coincidence in order to supply a trigger pulse via output circuits to the said ignition switch, and a reset input on said micro-computer for receiving reset pulses from a pulse generator, the improvement wherein the pulse generator comprises an RC-circuit connected to be chargeable by said output circuits of the micro-computer and to discharge between the trigger pulses to a residual voltage in dependence of the r.p.m. of the engine, and further comprising a sensing circuit coupled between the RC-circuit and said reset input for generating said reset pulse proceeding from a residual voltage which falls below a predetermined reference value for the residual voltage.

4,597,374

CONSTRUCTION OF A HEATING COMPARTMENT FOR COOKING APPARATUS

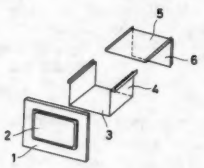
Noboru Igarashi, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 11, 1982, Ser. No. 387,439

Claims priority, application Japan, Jun. 16, 1981, 56-89063[U]; Jun. 16, 1981, 56-89064[U]; Jun. 16, 1981, 56-89065[U]; Jun. 16, 1981, 56-89066[U]; Jun. 16, 1981, 56-89067[U]; Jun. 16, 1981, 56-89068[U]; Sep. 14, 1981, 56-137761[U]

Int. Cl.⁴ A21B *1/00*

U.S. Cl. 126—19 R **10 Claims**



1. A heating compartment for treating foods with microwaves in a microwave cooking apparatus, comprising:

a plurality of panel elements defining sides of said compartment joined together along mutually adjacent edges whereat two of said panels meet, said edges being joined by curling said edges about each other for interlocking said edges;

said compartment comprising at least one corner whereat three of said sides meet;

two of said sides comprising a substantially continuous portion substantially perpendicular to both said two sides and defining a flange extending about said corner and at least an adjoining surface defined by a third side stressed against said flange for sealing said corner against leakage of microwaves from said compartment.

4,597,375

WOOD BURNING FURNACE

David M. Pabis, 211-43rd St., Bloomingdale, Mich. 49026

Filed Feb. 1, 1985, Ser. No. 697,479

Int. Cl.⁴ F24H *3/12*

U.S. Cl. 126—117 **11 Claims**

1. A wood burning furnace comprising:

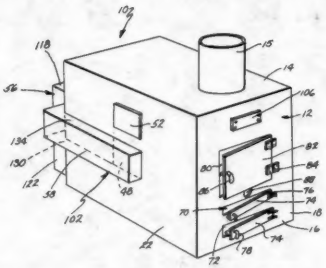
a furnace housing having front, rear, top, bottom and sidewalls;

a combustion chamber within said furnace housing having an enclosure wall means extending between said front and rear walls of said furnace whereby the said front and rear walls of said furnace housing form the front and rear walls of said combustion chamber, said enclosure wall means of said combustion chamber being spaced inwardly from said top, bottom, and sidewalls of said furnace housing to define an air circulation chamber therebetween;

air intake means for admitting ambient air into said air circulation chamber, whereby said ambient air may circulate within said furnace housing around said combustion chamber;

air exhaust means for exhausting said ambient air into the area to be heated after it has circulated through said air circulation chamber; and

ambient air preheating means for preheating said air before it is admitted into said air circulation chamber, said preheating means comprising a preheating chamber located on said rear wall of said furnace housing and combustion chamber whereby heat is directly conducted from said combustion chamber through said rear wall to said preheating chamber and a means for flowing air in said preheating chamber over the outer surface of said rear wall for heating said air previous to circulating said air within said furnace housing and means extending from said preheating chamber to said circulation chamber and communicating therewith to cause the flow of said preheated air from said preheating chamber to said circulation chamber.



4,597,376

HEAT RECOVERY HOOD

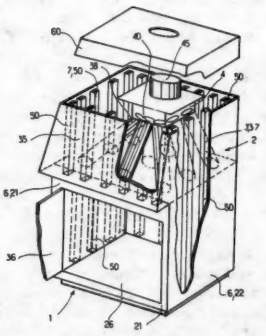
Maurice Gravier, 97 bis, rue de Belfort, 25000 Besancon; Denis Gravier, 25870 Auxon, Dessus, and Jean-Claude Gravier, 5a, rue de la Pernotte, 25000 Besancon, all of France

Continuation-in-part of Ser. No. 506,715, Jun. 23, 1983, abandoned. This application Dec. 17, 1984, Ser. No. 682,108

Claims priority, application France, Jun. 22, 1982, 82 11040

Int. Cl.⁴ F24B *7/00*

U.S. Cl. 126—121 **4 Claims**



1. A heat recovery and heat storage hood for use placed about a firebox of a fireplace comprising, a solid structure made of a massive mass of heat-absorbing material and having ducts capable of heating air therein and storing heat and radiating stored heat therefrom after combustion has terminated in the fire-box, the solid structure having vertical sidewalls positioned about vertical sidewalls and a backwall of the firebox and a large heat-storing volume of said heat-absorbing material

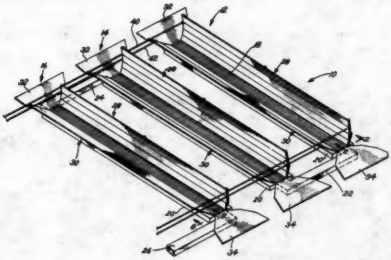
defining a top for the firebox, means defining a heat-recovery collector in which hot air is collected disposed over the large heat-storing volume, said ducts being disposed in the sidewalls of the solid structure in communication with space externally of the firebox base and having open ends communicating with said heat-recovery collector, said ducts being disposed for receiving heat from the sidewalls and backwall of the firebox for heating air in the ducts for convection flow into the heat-recovery collector, the large heat-storing volume defining internally therein a hot gas collector chamber, said large volume of heat-absorbing material having a plurality of spaced hot gas inner flues open to a surface thereof defining the top of the firebox and in communication with the hot gas collector chamber for flow of hot gases and smoke upwardly from the firebox to enter into the hot gas collector chamber for heating the heat-absorbing material, a tubular member open to the hot gas collector chamber passing through said heat-recovery collector without communicating therewith for heating hot air in the heat-recovery collector by hot gases from combustion passing therethrough and extending therefrom for communication with a chimney of the fireplace, and the heat-recovery collector providing communication exteriorly thereof for heating with hot air collected therein.

4,597,377

SOLAR REFLECTOR SYSTEM

Alan M. Melamed, 1000 Grove St., Evanston, Ill. 60201

Filed Oct. 9, 1984, Ser. No. 658,754
Int. Cl.[4] F24J *2/10*
U.S. Cl. 126—438 **14 Claims**



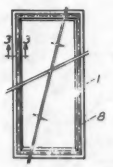
1. A solar reflector system for reflecting solar energy to an elongated solar receiving area disposed generally in an east-west direction and for helping to optimize the performance versus cost ratios of concentrating solar collector systems utilizing said solar reflector system, said solar reflector system comprising an elongated side reflector panel means to be hinged relative to said solar receiving area, hinge means adjacent the solar receiving area for pivotally connecting said reflector panel means relative to said solar receiving area, said reflector panel means including a reflector surface comprised of a plurality of flat planar reflector panels that are each elongated parallel to said solar receiving area for about the length of said solar receiving area, with adjacent flat planar reflector panels comprising said reflector surface sharing a common edge that extends parallel to said solar receiving area and forming an angle appropriate to facilitate efficient performance of the overall reflector panel means in reflecting solar energy to said solar receiving area, means for adjusting one, some, or all of the angles formed by adjacent flat planar reflector panels comprising the reflector surface, wherein the curvature of the overall reflector surface may be altered on a seasonal basis, and means for adjusting the entire reflector panel means relative to the solar receiving area about said hinge means, so as to improve year-round reflector panel means performance in reflecting solar energy to the solar receiving area.

4,597,378

SOLAR ENERGY COLLECTOR AND GLAZING SYSTEM

William F. Smith, 353 DeSoto Dr., New Smyrna Beach, Fla. 32069

Filed Sep. 12, 1983, Ser. No. 531,406
Int. Cl.[4] F24J *2/46, 2/00*
U.S. Cl. 126—450 **6 Claims**



1. In a solar collector having a housing, an absorber and at least two glazings in which the inner glazing is a film, wherein the improvement comprises:

said housing supporting a glazing shoulder;

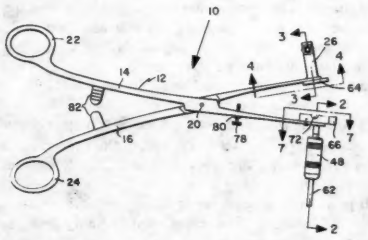
a plurality of tenter strips, of substantially right angle sectional configuration having a ball-like cross-section at one side thereof and a smooth contact profile arm at the other side thereof, a plurality of grooves formed in said glazing shoulder in which said tenter strips rest, disposed within said tenter strips said housing having the ball-like side thereof in hinged connection with said grooves to secure the film therebetween and the smooth contact side thereof extending downwardly in an initial position for contact with the film, and an outer glazing is uniformly superposed on the hinged tenter strips to uniformly press the tenter strips downwardly to a final position for the smooth contact side thereof to contact the film and stretch, position and secure the film as the inner glazing.

4,597,379

METHOD OF COAGULATING MUSCLE TISSUE

Harry Kihn, Lawrenceville, N.J., and C. F. Douglas Ackman, Montreal, Canada, assignors to Cabot Medical Corporation, Langhorne, Pa.

Continuation of Ser. No. 276,506, Jun. 23, 1981, abandoned, which is a continuation of Ser. No. 39,652, May 16, 1979, Pat. No. 4,315,510. This application Mar. 30, 1983, Ser. No. 478,813
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—1 R **5 Claims**



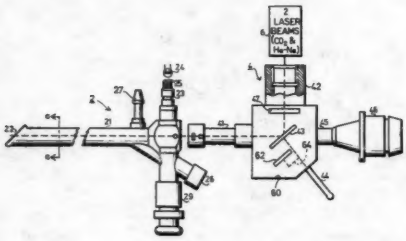
1. An in vivo, non-invasive method of permanently coagulating muscle tissue contained within fat tissue substantially without harming said fat tissue comprising directing radiation through said fat tissue towards said muscle tissue at a frequency of about 6 GHz to cause permanent coagulation of said muscle tissue substantially exclusively of said fat tissue, for about one minute to heat said muscle tissue within said fat tissue to a temperature of at least about 55° C. at which said muscle tissue permanently coagulates.

4,597,380

ENDOSCOPIC ATTACHMENT TO A SURGICAL LASER

Joshua Raif, Kiryat Ono, and Eliezer Zair, Bnei Brak, both of Israel, assignors to Laser Industries Ltd., Tel Aviv, Israel

Continuation-in-part of Ser. No. 431,204, Sep. 30, 1982, abandoned. This application May 23, 1984, Ser. No. 613,338
Int. Cl.[4] A61B *1/06*
U.S. Cl. 128—6 16 Claims



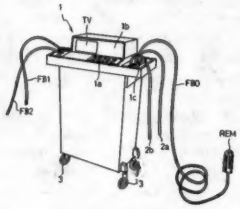
1. An endoscopic attachment to a surgical laser, comprising:
a hollow endoscopic tube coupleable at one end, constituting its rear end, to the surgical laser such as to enable the laser to transmit a laser beam through the endoscopic tube and to exit therefrom onto a working area at the opposite end, constituting the front end of the endoscopic tube;
said hollow endoscopic tube including a fitting at its rear end for a light source to illuminate the working area at the front end of the tube;
and a coupling device for coupling the surgical laser to said rear end of the endoscopic tube; said coupling device including;
a pivotable reflector in the path of said laser beam for reflecting same through the endoscopic tube to said working area at the front end thereof; and
a manipulatable joystick connected to said reflector for manipulating the laser beam to direct it through the endoscopic tube and to selected positions in said working area at the front end of the endoscopic tube;
said surgical laser producing both a working laser beam and a separate, visible, aiming laser beam; said endoscopic attachment further including an eyepiece enabling viewing the visible aiming laser beam;
said eyepiece being located coaxially with said hollow endoscopic tube at said rear thereof;
said coupling device directing both of said laser beams along an axis perpendicular to the axis of the endoscopic tube to be reflected by said pivotable reflector along said latter axis to said working area;
said pivotable reflector being highly reflective with respect to said working laser beam, and partially reflective and partially transmissive with respect to visible light to permit said aiming laser beam to be viewed through said eyepiece, said reflector further including a light absorber member connected therewith to said joystick so as to be moved with the reflector by the manipulation of said joystick;
said light absorbing member being located out of the optical path through said eyepiece to the working area, but in position to absorb the visible light of said aiming laser beam transmitted through said reflector.

4,597,381

APPARATUS FOR MONITORING AN ARTIFICIAL INTERNAL ORGAN

Takeharu Oumi, Toyota, and Hideo Nakazawa, Tokyo, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Nov. 14, 1984, Ser. No. 671,355
Claims priority, application Japan, Nov. 14, 1983, 58-213749
Int. Cl.[4] A61B *1/04*
U.S. Cl. 128—6 7 Claims



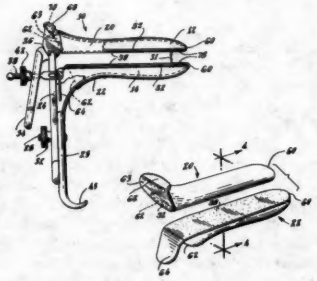
1. An apparatus for monitoring an artificial internal organ having a moveable portion comprising:
an optical fiber having a part thereof fixed to said artificial internal organ such that one fore end of said optical fiber faces the movable portion of said artificial internal organ, for transmitting image information to a remote location;
photo/electric conversion means coupled to the other end of said optical fiber;
image display means connected to said photo/electric conversion means; and
illumination means for emitting a beam of light toward the movable portion of said artificial internal organ.

4,597,382

MEDICAL SPECULUM AND PROCEDURE

Raul Perez, Jr., 109 Woodlawn Rd., Monroe, Conn. 06468

Filed Mar. 16, 1984, Ser. No. 590,432
Int. Cl.[4] A61B *1/32*
U.S. Cl. 128—17 23 Claims



1. An improved speculum comprising:
a. first and second generally parallel, longitudinally extending members;
b. means intercoupling said members for adjusting the relative spatial position therebetween and for restraining said members in fixed relative spatial positions;
c. a disposable body positioned on at least one of said members;
d. said body being nonreflective to radiant energy and adapted to dissipate impinging radiant energy when wetted; and,

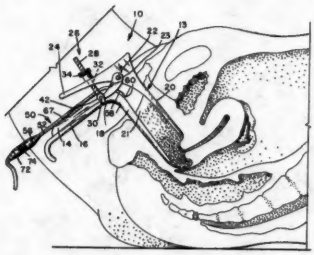
e. means for retaining said body on said member, whereby radiant energy projected between said members during a medical procedure and which impinges on said body is dissipated.

4,597,383

FIBER-OPTIC ILLUMINATED VAGINAL SPECULUM

Frans G. VanDerBel, Southbridge, Mass., assignor to Luxtec Corporation, Sturbridge, Mass.

Filed Apr. 25, 1985, Ser. No. 727,400
Int. Cl.[4] A61B *1/30*
U.S. Cl. 128—18 11 Claims



1. Vaginal speculum comprising:

(a) a supporting base,

(b) A fixed jaw which is mounted on the supporting base and which extends substantially at a right angle to the supporting base,

(c) a movable jaw which is generally parallel with the fixed jaw and which is pivotally mounted to the supporting base for movement toward and away from the fixed jaw between a closed postion in which the movable jaw is adjacent the fixed jaw to an open position in which the movable jaw is spaced from the fixed jaw to define an elongated viewing channel between said jaws,

(d) means for moving the movable jaw away from the fixed jaw to said open position and to maintain the movable jaw in said open postion,

(e) an elongated fiber-optic guide tube, one end of which is adapted to be connected to a fiber-optic light source, the opposite end of said guide tube having an opening for projecting a beam of light which emanates from said light source and which is transmitted through said guide tube, and

(f) means for mounting guide tube on said base so that the central axis of said beam of light is within said viewing channel, wherein said guide tube is mounted so that said opposite end is located at the end of said viewing channel which is adjacent said supporting base, and adjacent one lateral side of said viewing channel, said opposite end being adjacent said fixed jaw and bent toward the center of said viewing channel, so that the central axis of said beam of light is substantially in the center of said view channel, wherein said base has a first surface which includes a pair of side edges and a second surface which extends at an angle from one side edge of said first surface, and wherein said mounting means comprises an L-shaped bracket which is fixed to said guide tube, said bracket having a first leg which is adapted to lie against said first surface and a second leg which is adapted to lie against said second surface, said first surface being a determinant of the position of the opposite end of the guide tube relative to said one end of the viewing channel and said second surface being a determinant of the position of the opposite end of the guide tube relative to the central axis of the viewing channel, and

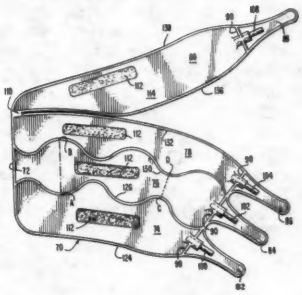
(g) means for releasably fastening said bracket to the base.

4,597,384

SEQUENTIAL COMPRESSION SLEEVE

John K. Whitney, Dorado Beach, P.R., assignor to Gaymar Industries, Inc., Orchard Park, N.Y.

Filed Jun. 29, 1984, Ser. No. 626,015
Int. Cl.[4] A61H *7/00*
U.S. Cl. 128—24 R 5 Claims



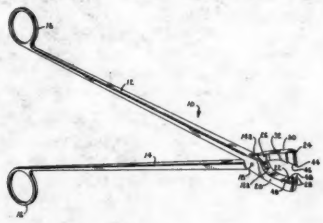
1. A device for use in applying successive compressive pressures against a patient's limb from a source of pressurized fluid, said device comprising an elongated sleeve adapted for application around a length of a patient's limb, and extending from a lower portion to an upper portion thereof said sleeve having a plurality of laterally extending separate fluid pressure members progressively arranged from a lower portion of the encased limb to the upper portion thereof, each pressure member having lateral edge portions, means to prevent a complete pressure gap around any entire 360° cross sectional portion of the encircled limb, said means including the shaping of adjacent lateral edge portions of adjacent pressure members in substantially an undulating curve and in unison whereby the respective contiguous edges thereof follow each other so that when pressure is sequentially applied from the lowermost pressure member heartward there will never be a pressure gap on any entire 360° cross sectional portion of the encircled limb and means releasably securing the sleeve about the patient's limb with the pressure members encircling the limb.

4,597,385

BIOPSY INSTRUMENT

Trevor F. Watson, 2319 Bluff Blvd., Columbia, Mo. 65201

Continuation of Ser. No. 490,122, Apr. 29, 1983, abandoned.
This application Jan. 8, 1985, Ser. No. 689,711
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—751 17 Claims



1. An instrument for use in obtaining a cervical biopsy specimen, said instrument comprising:

a pair of pincer arms each having a handle on one end and a jaw on the other end, said pincer arms being connected in a manner to effect closure of the jaws when the handles are moved together;

gripping means on one jaw for gripping the cervix adjacent the biopsy specimen to hold and stabilize the cervix;

a blade on the other jaw having the general shape of a U in section and presenting a sharp cutting edge on the leading edge thereof, said cutting edge having a sharp point located at the distal end of the cutting surface of said blade for undercutting the cervix and side portions on opposite sides of and trailing said point for slicing the cervix to remove the biopsy specimen during closure of said jaws, said blade presenting a cavity for receiving the biopsy specimen as same is cut from the cervix; and

a recess in said one jaw located adjacent said gripping means and having a size and shape to receive said blade when said jaws are closed.

4,597,386

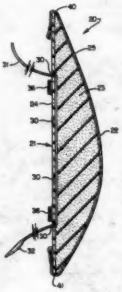
LUMBAR SUPPORT SYSTEM

Morton I. Goldstein, 2658 E. Broad St., Columbus, Ohio 43209

Filed Feb. 21, 1984, Ser. No. 581,710

Int. Cl.[4] A61F *5/02*; A47C *7/02*

U.S. Cl. 128—78 **14 Claims**



1. A lumbar support system constructed for application on the back rest of a human body upholding structure, the human body having a natural and generally longitudinal lumbar lordosis, comprising:

a. A semi-rigid and preformed flexible planar panel element constructed and configured to attach to the back rest, and to extend essentially to the periphery of the support system, to flex curvilinearly in the transverse direction to the longitudinal axis of lumbar lordosis, the curvilinear flexure thereof providing a columnar beam structural longitudinal rigidity in the cephalo-caudal direction of the human body on the upholding structure, and proper lumbar support thereto, from the upper end to the lower end and there between; and

b. A resilient force resisting means constructed of a material less rigid than said flexible panel, assembled to the panel at one face thereof, and having a second surface thereof with a general curvature of a predetermined lumbar lordosis, selectively positionable at the optimum lumbar supporting position of the human body upheld in the structure.

4,597,387

DEEP DIVING APPARATUS

Alistair L. Carnegie, deceased, late of Yeovil, and by Norma E. Carnegie, executrix, 247 Mudford Road, Yeovil, Somerset, both of England

Filed Oct. 24, 1983, Ser. No. 544,987

Claims priority, application United Kingdom, Oct. 25, 1982, 8230432

Int. Cl.[4] B03C *11/02*

U.S. Cl. 128—201.27 **4 Claims**

1. A pressure regulatory valve system for relief of overpressure in a gas supply line extending from a gas source within a diving bell to the helmet of a diver working underwater outside the bell and for relief of under pressure in a gas return line extending from the diver's helmet to the bell, the pressure regulatory valve system comprising,

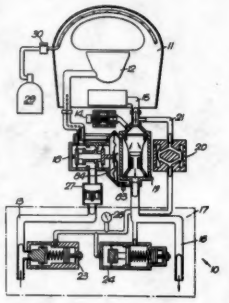
a pair of pressure relief valves including means adapted to be positioned within the diving bell,

one of the relief valves including means adapted for connection to the gas supply line and the interior of the diving bell,

a flow path through said one relief valve adapted to connect the gas supply line to the interior of the bell,

the other relief valve including means adapted for connection to the gas return line and the interior of the diving bell,

a flow path through said other relief valve adapted to connect the interior of the bell to the gas return line,



a pressure datum chamber in each of said relief valves,

means adapted to be connected with the diver's helmet and operatively connected with the pressure datum chambers in said relief valves for communicating the gas pressure in the diver's helmet with the pressure datum chambers,

control means disposed in the flow paths of each of said relief valves and responsive to the gas pressure in the pressure datum chamber, the line and the diving bell for regulating the flow through said flow path overpressures in the supply line and overpressures in the return line are relieved to maintain the appropriate pressure in the diver's helmet at various depths with respect to the bell.

4,597,388

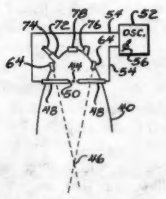
APPARATUS FOR REMOVING CATARACTS

Jeffrey Koziol, Mt. Prospect; Christopher Nowacki, Arlington Heights, and Alfred G. Brisson, Schaumburg, all of Ill., assignors to Trutek Research, Inc., Arlington Heights, Ill.

Filed Dec. 15, 1983, Ser. No. 561,894

Int. Cl.[4] A61B *17/36*

U.S. Cl. 128—303.1 **5 Claims**



1. Apparatus for removing an eye lens comprising hydraulic fluid, means for supporting said hydraulic fluid on the eye, means for generating a shock wave in said hydraulic fluid, means for focusing said shock wave comprising reflector means to apply said shock wave through said hydraulic fluid to the lens of said eye to liquify said lens, said reflector means

including a portion of an ellipsoid having a first focal point within said reflector means and a second focal point outside of said reflector means, said reflector means being movable to position said second focal point within said lens, the means for generating a shock wave generating said shock wave at the first focal point, and three dimensional aiming means, comprising intersecting laser beams, connected to said reflector means and aimed at said second focal point for locating said second focal point within said lens.

4,597,389

DEVICE FOR REMOVING OBJECTS FROM TUBULAR BODY PASSAGES

Adel A. Ibrahim, 50 Camelot Dr., Huntington, W. Va. 25701; Kevin D. Linville, 6257 Sturm Rd., Huntington, W. Va. 25705, and Jerry E. Mays, 212 Short St., Huntington, W. Va. 25702

Continuation of Ser. No. 430,016, Sep. 30, 1982, abandoned. This application Feb. 25, 1985, Ser. No. 705,410

Int. Cl.⁴ A61B *17/50*

U.S. Cl. 128—328 **4 Claims**

1. A device comprising means for removing objects from a tubular body passage comprising:

an elongated element having means for being movable through the interior of a tubular body passage without cutting into the interior walls thereof to a place a distal end thereof at a predetermined location within the body passage at which it surrounds an object which is located in the body passage and which is to be removed,

said means for being movable including at said distal end of the device a rigid ring which forms a full 360° closed circle and is of a small enough size to be movable through the interior of a body passage and which constitutes a means for surrounding the object, an inflatable balloon positioned inside of said ring means, said inflatable balloon comprising a means being movable radially inwardly, relative to the ring, upon inflation thereof, the ring itself for its full 360° constituting a means for prohibiting outward movement of the inflatable balloon upon inflation thereof, said ring having an opening at its distal end and an opening at its proximal end, said openings being large, relative to the thickness of the ring, such that the ring forms a large elongated opening therethrough from its distal to its proximal end, which elongated opening is substantially unobstructed when the balloon is uninflated, so that as the ring moves through the body passage with the balloon uninflated, the ring surrounds objects in the body passage which are in turn movable through the said openings of the ring,

means for selectively introducing fluid into the inflatable balloon to cause said inward inflation thereof,

the said ring, when surrounding the object with a balloon inflated inwardly engaging and grasping the object constituting a means for grasping the object and removing the object upon withdrawal of the ring from the tubular body passage,

said ring means having a cylindrical exterior and an inwardly beveled distal end shaped to facilitate movement of the ring through the tubular body portion and around the object, and the distal end of the ring means lying in a plane which is inclinded relative to the axis of the ring, such that only one portion of the ring means leads the rest as the ring means is moved through the tubular body passage.

4,597,390

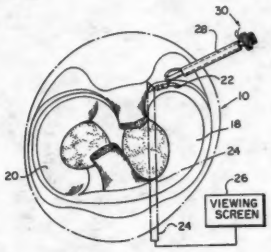
SURGICAL NEEDLE MANIPULATOR

James S. Mulhollan, 3401 Foxcroft Rd., Little Rock, Ark. 72207, and Lionel Starr, 8806 Patricia Lynn, Sherwood, Ark. 72116

Filed Apr. 2, 1984, Ser. No. 595,818

Int. Cl.⁴ A61B *17/06*

U.S. Cl. 128—340 **11 Claims**



1. A device for manipulating a surgical needle, comprising: a hollow tube having knurled flange at one end and a pair of diametrically opposed slots at an opposite end,

a rod member sized to telescopically fit within said hollow tube having a knurled flange at one end and a flat face with a diametrical slot formed therein at an opposite end,

said rod member rotatable within said tube to permit alignment and misalignment between said slots in said tube and said slot in said rod member, whereby, said slots, upon alignment, can receive the shank of said surgical needle, and upon relative rotation of said rod member, said device will grip said needle for manipulation.

4,597,391

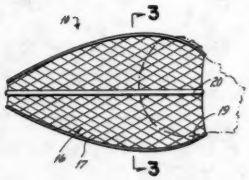
OBSTETRIC TRACTIVE DEVICE

Albert B. Janko, 977 Pacific St., Monterey, Calif. 93940

Filed Sep. 26, 1985, Ser. No. 780,445

Int. Cl.⁴ A61B *17/42*

U.S. Cl. 128—361 **6 Claims**



2. A tractive obstetric device comprising:

a net formed of a frangible material,

means to secure the net in a generally tubular configuration when one portion of the net is placed around the head of a fetus in utero, such that another portion of the net can be grasped and pulled to effect delivery of the fetus,

the net when put in traction being adapted to rupture at a predetermined limiting level of tractive tension thereby to lessen the risk of injury to the fetus during such tractive delivery.

4,597,392
ARRANGEMENT FOR MEASURING DIFFUSING PARTICLES

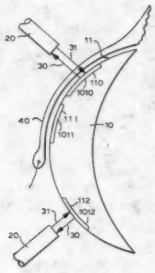
Norbert Opitz, Schwerte, and Dietrich W. Lübbers, Dortmund, both of Fed. Rep. of Germany, assignors to Max Planck Gesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 2, 1984, Ser. No. 597,105

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1983, 3313047

Int. Cl.⁴ A61B *5/00*

U.S. Cl. 128—637 **10 Claims**



1. An arrangement for measuring diffusing particles comprising a plurality of material limited indicator chambers permeable to the particles to be measured and provided with optical fluorescent indicators which are optically changeable by the particles for simultaneously measuring several physical parameters and/or several types of particles, said indicator chambers being formed as optodes; a carrier body having a surface arranged to lie on a lid under the latter and provided in this surface with depressions in which said optodes are arranged; at least one monochromatic irradiation source arranged to irradiate said optodes; and a light measuring device arranged to measure light going out of the optodes and its change.

4,597,393
ARTERIAL PRESSURE MEASURING APPARATUS

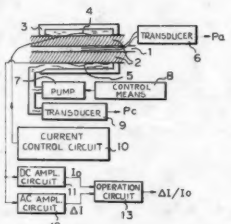
Ken-ichi Yamakoshi, Sapporo, and Hideaki Shimazu, Tokyo, both of Japan, assignors to Kabushiki Kaisha Copal Takeda Medical Kenyusho, Tokyo, Japan

Filed Mar. 28, 1984, Ser. No. 594,353

Claims priority, application Japan, Mar. 31, 1983, 58-56135

Int. Cl.⁴ A61B *5/02*

U.S. Cl. 128—677 **20 Claims**



1. A non-invasive arterial pressure measuring apparatus for detecting arterial pressure, comprising:

systolic pressure value Pas measuring means including a cuff adapted to be applied to a limb of a body having arterial pressure for inflation of the cuff to raise the internal pressure therein to a value above the systolic arterial pressure of the body whose arterial pressure is to be measured by the systolic pressure value Pas and for gradually reducing the pressure to the systolic pressure;

sequence control means coupled with said cuff for measuring the output thereof at a highest arterial pressure value Pas and responsive to said cuff output for storing the highest amplitude output while discarding previous lower amplitude outputs and non-storing of subsequent lower amplitude outputs to obtain and provide a mean arterial pressure value Pam; and

means coupled with said cuff and responsive thereto for determining the lowest arterial pressure value Pad.

4,597,394
METHOD FOR NONINVASIVELY MONITORING MOUTH VOLUME

Marvin A. Sackner, Miami Beach, Fla., assignor to Respitrace Corporation, Ardsley, N.Y.

Division of Ser. No. 266,850, May 26, 1981, Pat. No. 4,452,252. This application Feb. 1, 1984, Ser. No. 575,807

Int. Cl.⁴ A61B *5/10*

U.S. Cl. 128—777 **9 Claims**

1. A method for non-invasively monitoring mouth volume in a subject comprising:

disposing about the head of the subject means for detecting changes in cross-sectional area of the head, or a parameter indicative thereof, such that the plane defined by the detecting means extends through the mouth,

providing a signal indicative of the changes in the cross-sectional area or a parameter indicative thereof as detected by said detecting means, and

monitoring the signal, changes in the signal being indicative of changes in mouth volume.

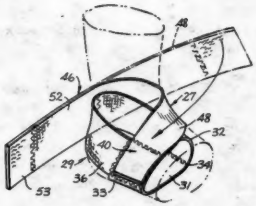
4,597,395
ANKLE SUPPORT INCLUDING A HEEL LOCK AND A CROSSOVER STRAP

Carl S. Barlow, and Alfred G. Jacobson, both of Sandpoint, Id., assignors to Barlow, Inc., Sandpoint, Id.

Filed Aug. 23, 1985, Ser. No. 768,704

Int. Cl.⁴ A61F *3/00*

U.S. Cl. 128—80 H **17 Claims**



1. An ankle support, comprising:

an elongated heel strap extending between a medial and a lateral end;

an elongated plantar strap extending between a medial and a lateral end;

first fastener members joining the respective like medial and lateral ends of the heel strap and plantar strap such that

the medial ends of the heel and plantar straps are joined together and the lateral ends of the heel and plantar straps are likewise joined together and such that the heel strap can be received over the Achilles tendon area of the heel with its ends extending forwardly over medial and lateral sides of the foot and so the plantar strap can be received over the plantar surface of the foot adjacent the heel with the lateral and medial ends extending upwardly to lateral and medial surfaces of the foot;

an elongated crossover strap extending between opposed free ends and fastened substantially midway between its free ends to the heel strap at a location thereon approximately midway between the medial and lateral heel strap ends, defining medial and lateral strap/sections extending in opposite directions from the heel strap;

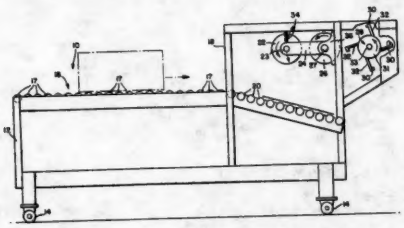
second fastener members at the free ends of the crossover strap for releasable engagement with the first fastener members such that the medial crossover strap section can be extended diagonally over the foot to join the second fastener member thereon with the first fastener member at the lateral ends of the heel and plantar straps, and such that the lateral crossover strap section can be extended diagonally over the foot to join the second fastener member thereon with the first fastener member at the medial ends of the heel and plantar straps.

4,597,396

FARMER'S BALE DELAMINATOR

Dewey L. Holt, and Benjamin F. Reynolds, both of Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Jan. 31, 1983, Ser. No. 462,262
Int. Cl.[4] A24B *1/00, 3/00*
U.S. Cl. 131—327 **10 Claims**



1. Apparatus for delaminating farmer's bales of tobacco, comprising:

means for gripping and feeding a bale in a uniform and controlled manner at a selected rate; and

means for slicing a bale into lamina of about a selected thickness, adjacent the output of said gripping and feeding means; wherein said slicing means includes

a powered roller;

a plurality of pins arranged in a plurality of circumferentially spaced rows, projecting from said roller; and

a plurality of delamination knives, each said knife being fixed to the projecting ends of one of said rows.

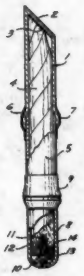
4,597,397

CIGAR CARTRIDGE WITH A SELF IGNITING CIGAR

Friedrich Weinert, 219-19-131st Ave., Jamaica, N.Y. 11413

Continuation-in-part of Ser. No. 358,855, Mar. 17, 1982, Pat. No. 4,491,139. This application Oct. 22, 1984, Ser. No. 663,199
Int. Cl.[4] A24D *1/08*
U.S. Cl. 131—351 **1 Claim**

1. A cigar in combination with a tubular cigar cartridge with a self-igniting device wherein the cigar has a mouth end having a flat planar surface, the surface disposed at an acute angle with respect to the longitudinal axis of the cigar; the cartridge enclosing the cigar comprising a top, middle and bottom section; the top and bottom sections each comprising a tube having a closed and open end, the top section closed end having a cigar rotation limiting means for preventing the cigar from rotating and prematurely igniting comprising a slanted planar surface disposed at substantially the same angle as the cigar mouth end surface and contacting the same; the middle section being fireproof and cylindrical and having two open ends wherein the top and bottom section open ends overlap the middle section open ends and are attached thereto by a tape seal means for preventing rotation of any section with respect



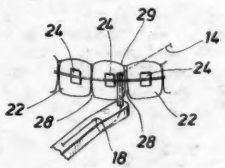
to another, whereby after breaking the seals the middle section is slidable with respect to the cigar; the igniting device comprises an igniting tube inserted into the cigar end opposite the mouth end having a central portion chemically treated with a flammable substance that will ignite upon friction, a piston inserted into the igniting tube and frictionally fitted therein, a string with one end attached to the piston and the other end attached to the closed end of the cartridge bottom section so that when the string is pulled the piston will frictionally engage the central portion so as to ignite the flammable substance, and a gas filter on the outside of the igniting tube and surrounding the same to limit toxic gases from penetrating into the cigar.

4,597,398

ORAL HYGIENE INSTRUMENT FOR USE WITH ORTHODONTIAL APPLIANCES AND METHOD OF CLEANING SAME

Grace M. M. Chu, 2227 Foreland, Houston, Tex. 77077

Filed Feb. 15, 1985, Ser. No. 702,246
Int. Cl.[4] A61C *15/00*
U.S. Cl. 132—92 R **21 Claims**



1. An oral hygiene instrument for use in cleaning between a plurality of teeth having a wire spaced a predetermined distance from the outer surfaces of said teeth and in outwardly-spaced relation thereto, comprising:

an elongated handle member;

means interconnected to one end of said handle for inserting between said wire and said teeth, said means comprising a post having a dental floss-receiving aperture extending longitudinally therethrough for supporting one end of a length of said floss at a location between said wire and said

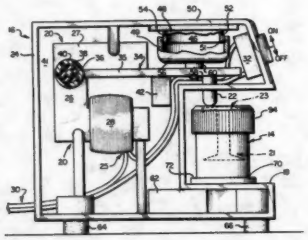
teeth, said post having a width less than at least one of said predetermined distances.

4,597,399

VIBRATOR ACTUATED LENS CLEANING SYSTEM

Richard Rabenau, Arab, and Rowland W. Kanner, Guntersville, both of Ala., assignors to Ryder International Corporation, Arab, Ala.

Filed Dec. 17, 1984, Ser. No. 682,365
Int. Cl.[4] B08B *3/12*
U.S. Cl. 134—184 **27 Claims**



1. A contact lens cleaning system comprising: container means for receiving a quantity of fluid and a contact lens therein; vibrator means for transmitting vibration to a predetermined portion of said container means; and fluid agitator means operatively associated with the interior of said container and including resilient means comprising said predetermined portion and locatable for contact with said vibrator means so as to further transmit vibration to said fluid, whereby said fluid will be agitated to produce fluid turbulance to promote effective cleansing of a lens; wherein said resilient means comprises a diaphragm disposed at a top portion of said container; wherein said agitator means further includes an agitating member of a resilient material and a shaft member interconnecting said diaphragm and said agitating member; wherein said vibrator means includes vibration generating means, vibration transmitting means operatively associated with said vibration generating means and said predetermined portion of the container for transmitting vibrations to said container; and wherein said vibrator means and said container means include cooperating locating means for locating said container means for impingement by said vibration transmitting means on a portion of said diaphragm spaced apart from the portion thereof at which said shaft member is connected.

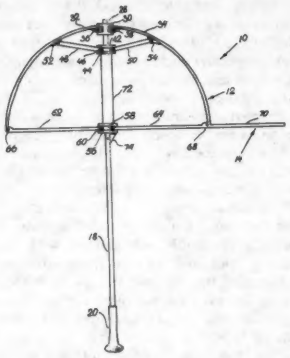
4,597,400

UMBRELLA, PARASOL AND THE LIKE

David L. Trudeau, Sr., 41 Lane Ave., Portland, Me. 04103

Continuation-in-part of Ser. No. 314,548, Oct. 26, 1981. This application Apr. 16, 1984, Ser. No. 601,028
Int. Cl.[4] A45B *21/00, 11/00, 25/18;* E04H *15/02*
U.S. Cl. 135—18 **4 Claims**

1. An umbrella said umbrella including a shaft having a longitudinal axis, a plurality of ribs pivotably mounted on said shaft, a plurality of spreaders interlinked with said ribs and adapted to interact with said shaft to extend and retract said ribs to open and close said umbrella, a webbing, said webbing adapted to be mounted on said ribs adapted to form a canopy when said ribs are extended and said umbrella is open, a plurality of extensions, said plurality of extensions, mounted along only a portion of the periphery of said canopy, said webbing supported on said extensions, said webbing integral to said canopy, and interlinkage means movably attached at one end to said shaft, the opposite end of said interlinkage means attached to said extensions and adapted to extend said extensions with said webbing substantially perpendicular from said axis when said umbrella is open and to retract said extension and webbing closely against the webbing of said canopy when said



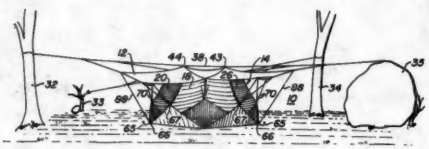
umbrella is closed, whereby said umbrella has the appearance of a large hat when open.

4,597,401

LIGHT WEIGHT TENT

James L. Fournier, P.O. Box 305, North Bennington, Vt. 05257

Filed Jul. 11, 1984, Ser. No. 629,684
Int. Cl.[4] A45F *1/00*
U.S. Cl. 135—90 **10 Claims**



1. A tent comprising:
a pentagonal-shaped roof canopy;
a central pentagonal zone within said roof canopy defined by five suspension points from which said roof canopy is supported;
a pentagonal-shaped floor; and
a netting enclosure of six panels forming one-half of a dodechohedron, with said enclosure oriented such that the top panel thereof is in a plane with said central zone of said roof canopy and wherein the bottom corners of the five side panels thereof are located along the midpoints of said pentagonal-shaped floor.

4,597,402

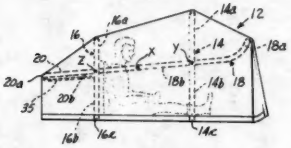
COLLAPSIBLE SHELTER

Lawrence J. Morris, Jr., 26729 Cypress St., Highland, Calif. 92346

Filed Sep. 19, 1984, Ser. No. 651,929
Int. Cl.[4] E04H *15/38*
U.S. Cl. 135—102 **14 Claims**

1. A collapsible shelter having an interior space of a defined configuration said collapsible shelter being adjustable from an upstanding configuration to a collapsed storage, or transportable configuration, comprising:
(a) first and second longitudinally spaced apart, generally vertically extending members, each said member having an upper end portion and transversely spaced leg portions terminating in ground engaging extremities;
(b) third and fourth generally horizontally extending mem-

bers, each said member having an interior space defining outer end portion and transversely spaced leg portions said leg portions having intermediate portions interconnected with said outer end portion and free ends, said leg portions of said third and fourth members being pivotally interconnected proximate said free ends, said leg portions of said third member being pivotally interconnected proximate said intermediate portions thereof with said leg portions of said first member intermediate said upper end portion thereof and said ground engaging extremities of said leg portions and said leg portions of said fourth member being pivotally interconnected proximate said intermediate portions thereof with said leg portion of said second member intermediate said upper end portion thereof and said ground engaging extremities of said leg portions; and



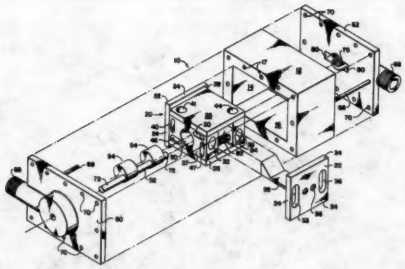
(c) cover means supported by said first, second, third and fourth members for enclosing the interior space defined by said members, said cover means being in engagement with said upper end portions of said first and second members and being in engagement with said outer end portions of said third and fourth members whereby an interior space of a defined configuration is formed.

4,597,403

NUTATION VALVING APPARATUS AND METHOD OF OPERATION

William W. Milburn, Jr., 945 Ninth St., Boulder, Colo. 80302

Filed Mar. 14, 1983, Ser. No. 474,829
Int. Cl.⁴ F02B *59/00*; F16K *31/524*
U.S. Cl. 137—1 **12 Claims**



10. A method of operating a nutating valving apparatus with a fixed plate having an opening defined therein with said opening being located in the face of said fixed plate and having leading and trailing linearly extending wall portions, and an adjacent nutating plate having at least one opening defined therein, with said opening in said nutating plate being located in the face of the nutating plate and having leading and trailing linearly extending wall portions, the method comprising:

opening the valving apparatus by moving each point of the nutating plate through a circle of nutation to move the opening in the nutating plate toward the opening in the fixed plate with the leading wall portions of said openings being maintained substantially parallel to one another so that the opening in the nutating plate at least partially overlaps the opening defined in the fixed plate;

flowing a fluid substance through the overlapped openings; and

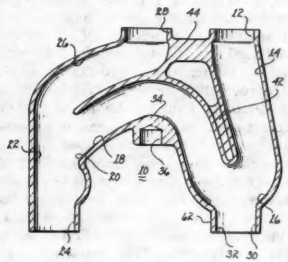
closing the valving apparatus by continuing motion of the nutating plate with the trailing edges of the openings in the nutating plate and fixed plate being maintained substantially parallel to one another to position the opening in the nutating plate in a spaced, nonoverlapping relationship to the opening in the fixed plate, whereby fluid flow is terminated by the sealing relationship of the fixed plate and nutating plate.

4,597,404

PLUMBING FIXTURE

Karel C. Van Marcke, Kruishoutem, Belgium, assignor to International Sanitary Ware Manuf. Cy., Kruishoutem, Belgium

Filed Sep. 6, 1985, Ser. No. 773,204
Int. Cl.⁴ F16K *3/36*
U.S. Cl. 137—1 **15 Claims**



1. An integrated plumbing fixture for providing a plurality of selectable fluid flow paths from an inlet, said integrated plumbing fixture comprising in combination:

(a) a generally downwardly aligned passageway extending from said inlet and terminating at a generally downwardly oriented outlet, said passageway including a lower end;

(b) a generally inverted U-shaped passageway extending from said lower end and terminating at an outlet, said inverted U-shaped passageway in combination with said lower end and said passageway defining a P-trap;

(c) a vent extending upwardly from said inverted U-shaped passageway;

(d) a further passageway extending downwardly from said inverted U-shaped passageway and terminating in a further generally downwardly oriented outlet;

(e) a generally horizontally oriented outlet disposed at said lower end;

(f) a further generally horizontally oriented outlet disposed in said further passageway proximate said further generally downwardly oriented outlet; and

(g) means for closing all but one of said generally downwardly oriented outlet, said further generally downwardly oriented outlet, said generally horizontally oriented outlet and said further generally horizontally oriented outlet to define the fluid flow path through said integrated plumbing fixture from said inlet.

4,597,405
PROCESS AND APPARATUS FOR CONTROLLING A CONTROLLABLE MAGNITUDE AND USE OF THE PROCESS

Hans Oetiker, St. Gallen, and Emanuel Kummer, Gossau, both of Switzerland, assignors to Gebruder Buhler AG, Uzwil, Switzerland

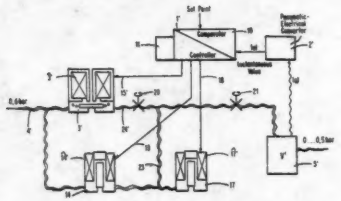
PCT No. PCT/EP83/00078, § 371 Date Oct. 18, 1983, § 102(e) Date Oct. 18, 1983, PCT Pub. No. WO83/03315, PCT Pub. Date Sep. 29, 1983

PCT Filed Mar. 16, 1983, Ser. No. 568,208

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1982, 3209494; European Pat. Off., Mar. 15, 1983, 83102532.5

Int. Cl.⁴ G05D *16/00*

U.S. Cl. 137—14 **24 Claims**



1. Process for controlling a controllable magnitude for throughput control of a pourable or fluid material through a feed line, comprising setting a predetermined value for the controllable magnitude, sensing the instantaneous value of the controllable magnitude as a function of throughput of said material in said feed line, comparing the set predetermined value with said instantaneous value to determine the amount and direction of deviation between said instantaneous and predetermined values, dividing the deviations thus determined into three ranges, namely a fine range having upper and lower limits and within which lies first and second threshold values, an upper coarse range exceeding the upper limit of the fine range and a lower coarse range exceeding the lower limit of the fine range, introducing fluid to or discharging fluid from a fluidic pressure drive via a fine control valve, when said deviation is in the fine range thereof, until the first or second threshold values is reached, reversing fluid flow whenever said deviation has reached said first or second threshold values, and for deviations in the upper and lower coarse ranges introducing fluid to or discharging from said fluidic pressure drive via a coarse discharge valve or a coarse inlet valve when said deviations are in the coarse ranges thereof.

4,597,406
DEVICE FOR SUPPLYING A PIPE WITH A FLUID AT A PARTICULAR PRESSURE FROM ALTERNATIVE SOURCES

Gérard Loiseau, Bois D'Arcy; Maurice Molozay, Le Mesnil-Saint-Denis, and Michel Rigo, Lozanne, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

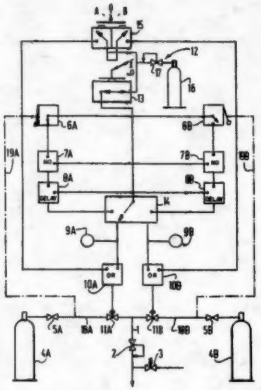
Filed Apr. 10, 1984, Ser. No. 598,750

Claims priority, application France, Apr. 11, 1983, 83 05859

Int. Cl.⁴ F17C *13/04*

U.S. Cl. 137—113 **14 Claims**

1. A device for supplying a utilization pipe with a fluid under a utilization low pressure, the fluid coming from either of two vessels initially containing said fluid under a high pressure, said device comprising, for each vessel: a supply pipe connecting the vessel to said utilization pipe; a shut-off valve mounted in said supply pipe; and a switch arranged to sense the degree of filling of the vessel; the device further comprising a single pressure regulator mounted in said utilization pipe, subjected at an inlet thereof to the pressure prevailing in the vessel supplying fluid and arranged to deliver the fluid at an outlet thereof under said utilization low pressure, switching means controlling the two shut-off valves and actuated via said switches, means for manually overriding the switching means, an auxiliary energy source serving the purpose of operating the said switching means and connected to the said switching means via the said switches, and for each vessel, an inclusive "OR"



logic unit of which one inlet is connected to a corresponding outlet of said switching means, of which a second inlet is connected to a corresponding outlet of a three-position manual switch supplied by the said auxiliary energy source, and of which an outlet is connected to a control inlet of the corresponding shut-off valve.

4,597,407
FUEL CONTROL SYSTEM FOR A GAS TURBINE ENGINE

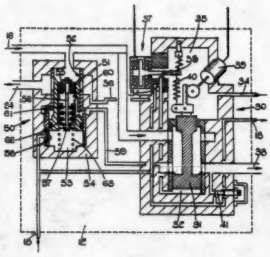
Trevor S. Smith, Four Oaks, England, assignor to Lucas Industries public limited company, Birmingham, England

Filed Oct. 11, 1983, Ser. No. 540,559

Claims priority, application United Kingdom, Oct. 28, 1982, 8230796

Int. Cl.⁴ G05D *11/00*

U.S. Cl. 137—115 **4 Claims**



1. A valve arrangement for a gas turbine engine fuel system, said valve arrangement including means for controlling fluid flow therethrough in accordance with the differences between the magnitudes of a first pressure, second pressure, third pressure, and fourth pressure, and comprising:

a housing having a bore; first, second, third, and fourth openings in said bore communicating with fluid at first, second, third, and fourth pressures respectively;

flow control means located in said bore comprising valving

means for regulating fluid flow from said first opening to said second opening, said flow control means further comprising a piston slidably located in said bore, means for communicating said first and third pressures via their first and third openings to opposite sides of said piston thereby urging the piston in opposite directions;

a chamber formed by said flow control means and said bore, said fourth opening being in a wall of said chamber;

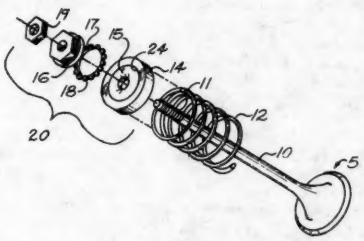
a regulating valve means for controlling fluid flow from said fourth opening through said chamber to said third opening thereby deriving a servo pressure in said chamber from said third and fourth pressures, said servo pressure functioning in part to control said valving means; said regulating valve means comprising an opening formed by cooperating surfaces on said valving means and said piston which by their relative positions determine the size of said opening.

4,597,408

ROTATING POPPET VALVE SYSTEM

Mark A. Canter, 1308 Dexter Dr., West, Port Orange, Fla. 32019

Filed Jun. 20, 1985, Ser. No. 746,746
Int. Cl.[4] F16K *29/00*; F01L *1/32*
U.S. Cl. 137—331 **2 Claims**



1. A rotatable poppet valve assembly comprising:

a poppet valve having a valve stem,, said valve stem threaded at its outer end;

a valve spring;

a circular valve spring retainer having parallel circular inner and outer surfaces, and a concentric bore therethrough, said outer surface having a concentric counterbore defining a first ball bearing race and said inner surface having a concentric circular groove for receiving said valve spring, said valve stem disposed through said concentric bore;

a valve retainer having a second ball bering race and a axially thraded bore;

a set of ball bearings disposed in said first ball bearing race and said valve retainer threaded onto said valve stem to engage said set of ball bearings with said second ball bearing race of said valve retainer within said counterbore, said valve retainer threadable for adjusting the tension of said valve spring; and

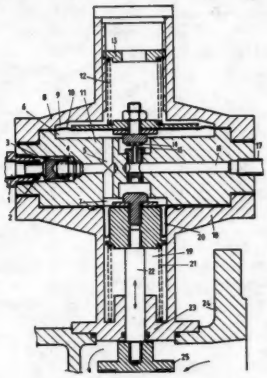
a lock nut threaded on said outer end of said valve stem for locking said valve retainer to said valve stem within said counterbore and thereby maintaining said ball bearings with said ball bearing race.

4,597,409

SAFETY DEVICE AGAINST OVERPRESSURE PARTICULARLY FOR GAS PRESSURE CONTROL APPARATUS

Adrianus M. J. Bruin, Huizen, Netherlands, assignor to Beta B.V., The Hague, Netherlands

Continuation of Ser. No. 495,660, May 18, 1983, abandoned.
This application Sep. 23, 1985, Ser. No. 779,606
Int. Cl.[4] F16K *17/00*
U.S. Cl. 137—461 **11 Claims**



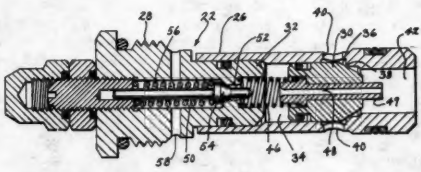
1. A safety device against overpressure of a gaseous or liquid fluid, whereby a safety valve in a main supply conduit for the fluid is actuatable by means of a spring loaded actuating member mounted in a housing, e.g. a first membrane, the pressure to be controlled being connectable through an inlet conduit in the housing, characterized in that said inlet conduit communicates with a measuring chamber of a second or measuring membrane to which a first control valve is secured, said control valve in its closed position closing the communication between an actuating fluid source and an actuating chamber of the first or actuating member, a communicating conduit being provided between said measuring chamber and said actuating chamber, a second conduit providing communication between the actuating fluid source and said actuating chamber, a control port in said second conduit opening into said actuating chamber, and a second control valve secured to said actuating member and adapted to close said control port.

4,597,410

CROSS LINE RELIEF VALVE MECHANISM

Raud A. Wilke, Brookfield, Wis., assignor to Husco International, Waukesha, Wis.

Filed Aug. 30, 1985, Ser. No. 771,218
Int. Cl.[4] F16K *17/18*
U.S. Cl. 137—491 **3 Claims**



1. A cross line relief mechanism comprising:

A. a body having a pair of service passages to provide portions of the service lines by which a reversible fluid motor is connectable with a control valve therefor, said body

also having a bore which is communicable only with said service passages;

B. a pair of main valves facing one another in the bore, one of each service passage and normally blocking communication between it and a zone of the bore between said main valves;

C. means defining a pair of chambers, one for each main valve in which the latter is slidably received to move into its chamber upon opening thereof;

D. means providing a peripheral surface on each main valve upon which pressure fluid in its associated service passage can exert force to effect opening thereof;

E. means at all times communicating each chamber with said zone of the bore so as to allow fluid in said chamber to be displaced to said zone upon such opening of its associated main valve;

F. passage means to communicate each of said chambers with its associated service passage;

G. a pilot valve normally closing the passage leading to each service passage and adapted to be opened in consequence of the admittance of fluid to said zone of the bore from the other service passage upon opening of the main valve therefor;

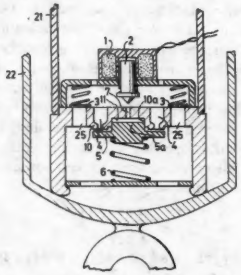
H. and a surface on each main valve exposed to said zone of the bore, upon which such fluid admitted to said zone can act to effect opening of the main valve under force exerted thereon by said fluid.

4,597,411

RESTRICTION VALVE DEVICE FOR HYDRAULIC PRESSURE FLUIDS IN VEHICLE SHOCK ABSORBING MECHANISMS

Magnus Lizell, Svalnäsvägen 13, S-182 63 Djursholm, Sweden

Filed Sep. 13, 1985, Ser. No. 775,895
Claims priority, application Sweden, Dec. 7, 1984, 8406224
Int. Cl.⁴ F16F *9/46*
U.S. Cl. 137—493.8 **10 Claims**



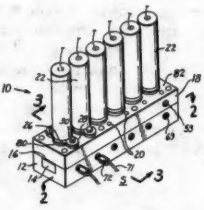
1. In a restriction valve device for hydraulic pressure fluid in a vehicle shock absorbing mechanism, said valve device being of the type comprising a valve seat member having at least one main opening for the passage of said pressure fluid, said main opening being closable by means of a movable spring-biased valve body, and at least one auxiliary opening for the pressure fluid, said auxiliary opening being selectively closable by a closure element, the improvement wherein said valve device is configured to provide a closed variable space which is confined between the valve seat member and the valve body, the auxiliary opening being connected with said space so that, when the closure element is open, the pressure fluid is admitted through said auxiliary opening to cause the pressure of said fluid so admitted to be exerted on said valve body and hence provide for an increased pressure force on said valve body against the force of the biasing spring so as to change the functional characteristics of the restriction valve device without effecting any significant flow of the pressure fluid via said auxiliary opening.

4,597,412

VALVE FOR SEQUENTIAL CHEMICAL OPERATIONS

Anton W. Stark, 2001 E. Galbreth Rd., Pasadena, Calif. 91104

Continuation of Ser. No. 426,809, Sep. 29, 1982, abandoned. This application Jan. 23, 1985, Ser. No. 693,690
Int. Cl.⁴ F16K *19/00*
U.S. Cl. 137—606 **22 Claims**



1. Valve apparatus for the sequential delivery of different fluids from a plurality of different fluid sources through a common passage to a predetermined destination such as a common vessel, said apparatus comprising a valve body having a valve seat-defining surface, and a separable valve body cover adapted to fluid tightly cover said surface; a plurality of separate passages through said valve body each communicating a valve body port beyond said valve seat surface with a local opening in said surface for delivery thereof of fluid from one of said different fluid sources; a groove in said valve seat surface extending longitudinally in said valve body to define said common passage, said groove being continuously upwardly open toward said valve cover in juxtaposed relation with each said valve seat surface opening across a respective intervening land; means controlling flow of fluid into said common passage from said separate passages, said fluid flow control means including a valve between said valve body and cover adapted to cooperate with said intervening lands in locally actuated relation to block or unblock flow from any or all of said separate passages to said common passage in any predetermined timed relation corresponding to a desired sequence of delivery of different fluids through said common passage, means providing positive fluid pressure within a plurality of said separate passages tending to locally unseat said valve for fluid flow locally from one of said separate passages to said common passage, individually actuable valve control means acting against said valve in local unseating blocking relation, the sequence of actuation of said valve control means determining the sequence of fluid flows to said common passage when a plurality of said separate passages are under positive fluid pressure, each of said valve control means comprising a solenoid operate plunger operative to seat said valve between a given separate passage and said common passage in seal maintaining relation against positive fluid pressure in said separate passage, said solenoid being carried by said cover and comprising a cylindrical body having an outer wall, and means securing said solenoid body to said cover in rapidly removable relation, said means comprising a cam element and cooperating structure on the solenoid body outer wall.

4,597,413

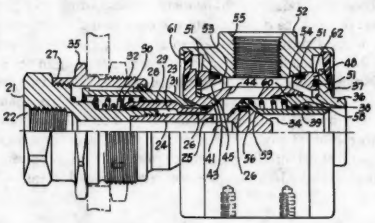
COUPLING APPARATUS

Richard A. Buseth, Jackson, Mich., assignor to Snap-Tite, Inc., Union City, Pa.

Filed Jun. 10, 1985, Ser. No. 743,097
Int. Cl.⁴ F16L *37/22*
U.S. Cl. 137—614.04 **18 Claims**

1. A coupling apparatus comprising a male member having a flow passage and a female member, said female member including a body member having an interior surface and a flow passage, a socket member having an exterior surface and a flow passage, an insert member having a first complementary sur-

face and a second complementary surface, said first complementary surface engaged in sliding contact with said interior surface of said body member permitting universal movement of said insert member relative to said body member, said second complementary surface of said insert member engaged in



sliding contact with said exterior surface of said socket member permitting radial movement of said socket member relative to said insert member, said radial movment of said socket member and said universal movement of said insert member, in combination, absorb angular and radial misalignment of said male member and said female member during engagement.

4,597,414

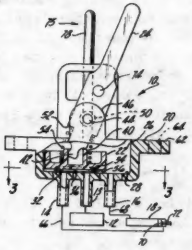
TWO POSITION CONTROL VALVE

LeRoy B. Johnson, Perry, Mich., assignor to Schmelzer Corporation, Flint, Mich.

Continuation of Ser. No. 389,026, Jun. 16, 1982, abandoned. This application May 29, 1985, Ser. No. 738,768

Int. Cl.[4] F16K *11/065*

U.S. Cl. 137—625.25 **8 Claims**



1. A two position fluid control valve comprising: a body having a planar control surface, a slide member supported by said body for reciprocating movement relative to said planar surface between first and second positions, a rectilinear porting ring formed integrally on said slide member, an O-ring seal element mounted on said rectilinear porting ring and being in sliding and sealing engagement with said planar control surface, said seal element forming an endless border of a control chamber formed between said planar surface and said slide member, first, second and third ports opening to said planar surface, said first and second ports being in communication with each other through said control chamber when said slide member is in said first position and said first and third ports being in communication with each other through said control chamber when said slide member is in said second position, a lever pivoted in an over-center spaced relation to said ports of said planar surface and having an end disposed in a socket formed in said slide for moving said slide member between said first and second positions upon movement of said lever about said pivot,

a spring having opposite ends seated on said lever and on said slide member for urging said slide member towards said planar surface during movement between said first and second positions,

cam means formed integrally with said slide member and with said planar surface and being engageable with each other upon movement of said slide member, between said first and second positions, to move said slide member and said planar surface apart and lift said O-ring from said planar surface, said cam means comprising a plurality of adjacently spaced projections formed on said slide member and said planar surface and each having an arcuate surface.

4,597,415

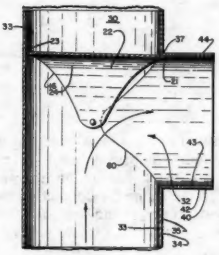
INTEGRATED LEVER AND LIVE SPRING VALVE

Steven S. Gieseke, Richfield, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.

Filed Jul. 23, 1985, Ser. No. 758,106

Int. Cl.[4] F16K *11/072*

U.S. Cl. 137—875 **6 Claims**



1. An air flow control valve, comprising:

(a) a tubular member having a wall and a side opening in said wall, said side opening being substantially similar in shape to a cross-section of said tubular member, said tubular member including a pair of opposite mounting points on said wall with at least one of said opposite points defining a hole through said wall;

(b) a flexible and resilient, normally planar flap having a first portion and a second portion which together form a generally elongated oval shape with a first and a second end, said flap including a pair of pivot points adjacent said first and second ends, said pivot points positioned such that with said flap in a planar state an imaginary line connecting said pivot points defines a common border for said first and second portions, said first and second portions each extending outwardly from said common border to a side edge, said first portion having a radius greater than said second portion, said flap including a handle integral with said flap at one of said pivot points;

(c) means for pivotally mounting said flap within said tubular member in line with said side opening with said pivot points being coaxially aligned and mounted to said opposite points on said wall of said tubular member and with said handle projecting through said hole and extending along said tubular member to form a generally arcuate shaped flap having an outer surface shaped like said wall at said side opening and having an outer edge configured to conform to said cross-sectional shape of said tubular member, said handle moving said flap between a first position in which said flap covers said side opening with said edge of said first portion substantially abutting against one side of said side opening and said side edge of said second portion overlapping an opposite side of said opening to seal off said side opening and allow air flow through said tubular member, and a second position in which said flap extends across said tubular member with said side edge of said first portion overlapping said opposite side of said side opening and said side edge of said second portion substantially abutting said wall of said tubular member opposite said side opening to seal off said tubular member

and direct air flow between said tubular member and said side opening.

4,597,416

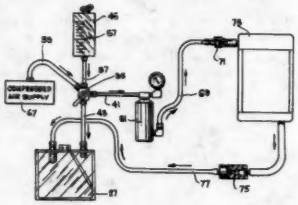
AUTOMOTIVE AIR CONDITIONING SYSTEM FLUSHING APPARATUS

Frank J. Scales, 901 S. Second St., San Jose, Calif. 95112

Filed Sep. 19, 1984, Ser. No. 652,747

Int. Cl.[4] B60P *3/22*

U.S. Cl. 137—899.4 14 Claims



7. An apparatus for pressurized flushing of automotive air conditioning systems comprising,

an upright hand-truck having an upright frame, wheels connected to the frame for contacting the ground, a low-level support lip projecting from the frame and having a forward edge, the upright frame having a top at approximately chest height on an adult with a handle near the top of the frame,

a solvent tank connected to the frame, the tank havng an inlet and an outlet, with a hose extending downwardly from the outlet,

a catch basin mounted on the support lip aligned in vertical orientation below said solvent tank and having a pair of inlets and an outlet,

a pressure tank mounted on the frame aligned in vertical orientation below said solvent tank and above said catch basin, said pressure tank having an input and an output and having sufficient solvent storing capacity for a single flush of said air conditioning system,

a pressure gauge mounted to said pressure tank, and

a valve associated with the pressure tank, said valve having fluidic connections to said solvent tank outlet hose, to said pressure tank input, to an inlet of said catch basin, and to a means for supplying fluidic pressure, said valve having a rotating handle which, when turned, sequentially admits solvent from the solvent tank to said pressure tank in a first position, then pressurizes said solvent with said fluidic pressure supply means in a second position, then releases pressure by directing pressurized solvent to said catch basin in a third position.

4,597,417

LIFTING UNIT FOR A ROTATIONAL DOBBY

Rudolf Schwarz, Horgen-Zuerich, Switzerland, assignor to Staeubli Ltd., Horgen-Zuerich, Switzerland

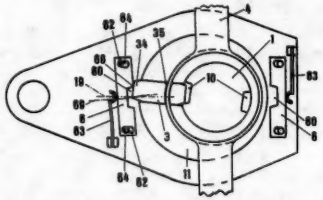
Filed Oct. 4, 1984, Ser. No. 657,719

Claims priority, application Switzerland, Oct. 7, 1983, 5477/83

Int. Cl.[4] D03C *1/00*

U.S. Cl. 139—76 21 Claims

1. A rotational dobby, comprising: a rotatably supported shaft having a groove therein; an eccentric ring rotatably supported on said shaft; a connecting rod which is rotatably supported on said eccentric ring, moves substantially radially of said shaft in response to rotation of said eccentric ring, and is adapted to be operatively coupled to a heddle frame for effecting movement thereof; a shifting wedge supported on said eccentric ring for radial movement between a radially inner position and a radially outer position and means for preventing angular movement of said shifting wedge relative to said eccentric ring, said shifting wedge having a radially inner end which is received in said groove in said shaft when said shifting wedge is in its radially inner position; a movably supported switching member and control means for effecting movement of said switching member according to a predetermined pattern, said switching member being operatively coupled to said shifting wedge and effecting radial movement of said shifting wedge relative to said eccentric ring in response to movement of said switching member by said control means; a unitary locking block which is spaced radially from said shaft and is supported for limited movement radially of said shaft and for limited pivotal movement about a pivot axis spaced from and substantially parallel to said shaft, said locking block having means defining thereon two spaced flank surfaces



which face in opposite directions circumferentially of said shaft, are disposed symmetrically on opposite sides of a centerline, and are fixed against movement relative to said locking block and each other; resilient means for yieldably urging said locking block radially inwardly relative to said shaft and pivotally toward a position in which said centerline is substantially parallel to the direction of radial movement of said shifting wedge; and means for preventing rotation of said eccentric ring about the axis of rotation of said shaft when said shifting wedge is in said radially outer position, including said locking block being supported on said connecting rod and being fixed against angular movement relative thereto about said shaft, and including said shifting wedge having a portion which is received between said flank surfaces on said locking block when said shifting wedge is in said radially outer position.

4,597,418

WOVEN SLIDE FASTENER

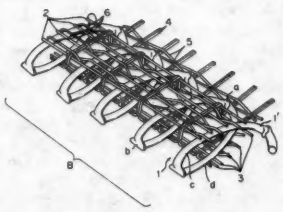
Masaatsu Ofusa, Toyama, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Nov. 9, 1984, Ser. No. 669,771

Claims priority, application Japan, Nov. 28, 1983, 58-183414; Nov. 28, 1983, 58-183415; Dec. 12, 1983, 58-191280

Int. Cl.[4] D03D *1/00*; A44B *19/34*

U.S. Cl. 139—384 B 4 Claims



1. A woven slide fastener having a tape fabric body, a continuous monofilament forming coil-shaped fastener elements and inserted in double picks in a longitudnal side edge of the tape fabric body, warp threads, and a weft thread extending continuously from the tape fabric body and woven together with the warp threads to form a unitary body, said woven slide

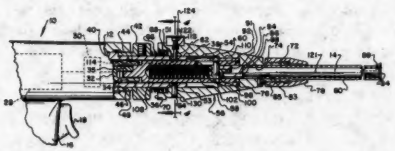
fastener comprising a plurality of upper binding warp threads running substantially linearly along an upper side of upper leg portions of the fastener elements, a plurality of lower binding warp threads running substantially linearly along a lower side of lower leg portions of the fastener elements, said upper and lower warp threads being arranged in warp threads constituting an element weave-in portion, and coil-fastening warp threads disposed between the binding warp threads and arranged to span and interlace with the continuous monofilament and the weft thread extending from the tape fabric body to the element weave-in portion on upper and lower sides of the continuous monofilament forming the elements, said weft thread being arranged to alternately run over and under the binding warp threads and the coil-fastening warp threads on the side of the upper leg portions of the elements and on the side of the lower leg portions of the elements.

4,597,419

BIT DRIVING ATTACHMENT FOR CONDUCTOR WRAPPING TOOL

Clifford L. Galloup, Reed City, and Paul D. Stack, Jr., Cadillac, both of Mich., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Aug. 13, 1985, Ser. No. 765,297
Int. Cl.[4] B21F *15/04*
U.S. Cl. 140—124 **14 Claims**



1. A conductor wrapping bit driving and support mechanism for use in a conductor wrapping tool, said tool having a motor casing including a motor, a bit indexing means for arresting rotation of said bit in a predetermined rotative position, drive shaft means and support means for said mechanism, said mechanism including;

a housing including means adapted to be engaged with said support means on said tool for connecting said mechanism to said tool, said housing including means for supporting a rotatable conductor wrapping bit;

a bit driver member interconnecting said drive shaft means and said bit; and

locking means associated with said housing for locking said bit driver member in a predetermined rotative position relative to said housing so that said housing may be removed from said tool and reconnected to said tool.

4,597,420

TECHNIQUES FOR MULTIPOINT DISPENSING OF VISCOUS MATERIAL

David Schoenthaler, Lower Makefield Township, Bucks County, Pa., and Thaddeus Wojcik, Hopewell Township, Mercer County, N.J., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

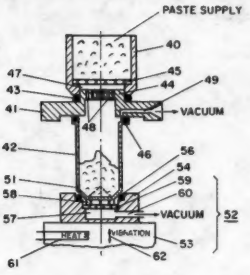
Division of Ser. No. 498,350, May 26, 1983, Pat. No. 4,515,297. This application Feb. 7, 1985, Ser. No. 699,210
Int. Cl.[4] B65B *1/08, 31/00*
U.S. Cl. 141—2 **13 Claims**

1. A method for loading solder paste into a solder dispensing tool having top, bottom and side portions, comprising the steps of:

placing a supply container of solder paste in transfer relationship with the top portion of the dispensing tool;

simultaneously applying vacuum through the top and bottom portions of the dispensing tool thereby drawing solder paste out of the supply container into the dispensing tool;

vibrating the dispensing tool for a first predetermined time period while the vacuum is applied; and



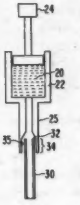
removing the vacuum while maintaining the vibration of the dispensing tool for a second predetermined time period.

4,597,421

METHOD AND DEVICE FOR ON-COLUMN INJECTION OF A LIQUID SAMPLE INTO SMALL DIAMETER COLUMNS

Gregory J. Wells, Suisun, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Nov. 19, 1984, Ser. No. 672,648
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—5 **13 Claims**



1. A method of injecting a liquid sample from a syringe means into a capillary column of inner diameter less than 200 microns through an open intake end thereof, said method comprising the steps of

connecting to said syringe means a tubular needle having an open injection end so that a course of liquid flow can be established from inside said syringe means through said tubular needle to said open injection end, the inner diameter of said needle being sufficiently larger than the outer diameter of said capillary tube over at least a predetermined length along said needle from said injection end,

inserting said capillary column inside said needle by said predetermined distance from said open injection end, thereby establishing inside said needle a passage for gas between the inner surface of said tubular needle and said capillary column,

causing said sample liquid to flow out of said syringe means into said needle, and

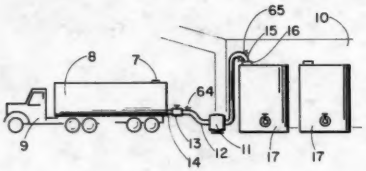
causing a gas to flow through said passage so as to force said liquid into entering said capillary column and to prevent said liquid from flowing through said passage towards said injection end.

4,597,422

WINE DISTRIBUTION METHOD AND APPARATUS

Sam Kovacevich, Jr., R.R. 1, Jug Handle Rd., Minooka, Ill. 60447

Division of Ser. No. 608,311, May 8, 1983, abandoned. This application Apr. 29, 1985, Ser. No. 728,015
Int. Cl.[4] C12G 1/00
U.S. Cl. 141—85 22 Claims



1. A closed conduit system for distributing wine from a winery in a first location to consumers in locations remote from said first location, including a first storage container at said winery, a mobile container mounted on a vehicle, a first air-tight conduit connectable between said first storage container and said mobile container, a second storage container at an intermediate location remote from said first location, a second air-tight conduit connectable between said mobile container and said second storage container, a relatively smaller portable container, a third air-tight conduit connectable between said second storage container and said smaller portable container, nitrogen injection means operatively associated with each of said first, second and third air-tight conduits to fill them with nitrogen to displace other fluid materials and expel such other fluid materials from said conduits, and fluid outlet means operatively associated with said conduits to permit said other fluid materials to escape as said conduits become filled with said nitrogen, including a filling machine, said filling machine including a wine distribution tube, a nitrogen distribution tube, said third air-tight conduit being connected between said second storage container and said wine distribution tube, a source of pressurized nitrogen connected to said nitrogen distribution tube, a plurality of wine outlet ports in said wine distribution tube in spaced apart location thereof, a plurality of nitrogen outlet ports in said nitrogen distribution tube in corresponding spaced apart locations thereof, said smaller portable container including a wine port opening to its interior and a nitrogen port opening to its interior, a first filler conduit connectable between one of said wine outlet ports of said wine distribution tube and said wine port of said smaller portable container, and a second filler conduit connectable between one of said nitrogen outlet ports of said nitrogen distribution tube and said nitrogen port of said smaller portable container, including a first coupling member connected to said first filler conduit for coupling to said wine port of said smaller portable container, and a second coupling member connected to said second filler conduit for coupling to said nitrogen port of said smaller portable container.

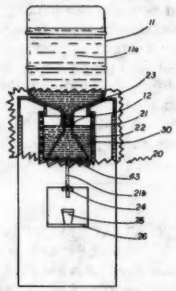
4,597,423

DEVICE FOR OPENING BOTTLED WATER CONTAINERS

Gary D. Chenot, 7550 Sterling Rd., Apt. 103A, Hollywood, Fla. 33024

Filed Mar. 26, 1985, Ser. No. 716,106
Int. Cl.[4] B65B 3/04
U.S. Cl. 141—330 4 Claims

1. In a water cooler comprising a refrigerated container and a seat for supporting an inverted water bottle directly over the mouth of said refrigerated container so that the mouth of said bottle is located within said refrigerated container when said inverted bottle is supported on said seat, the improvement comprising an inverted funnel having a frusto-conical portion connected to a tubular portion terminating in a slanted knife edge; said funnel being supported within said container on the wide end of said frusto-conical portion, the dimensions of said container and said funnel being so related to one another and said bottle that a sealed cap for said inverted water bottle remains spaced from said knife edge until said inverted bottle



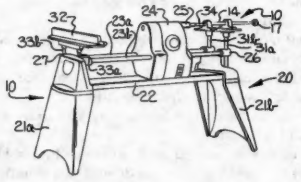
has its mouth aligned over the mouth of said container and said knife edge extends through said cap immediately before said inverted water bottle lowers onto a supporting portion on said seat so that water flows through said tubular portion, through said frusto-conical portion and into said container thereby enabling said inverted water bottle to be installed on said cooler without either exterior or interior water spillage.

4,597,424

CARVING ADAPTER FOR MULTI-PURPOSE WOODWORKING MACHINE

Robert L. Levan, Rte. 2, Box 87, Hiddenite, N.C. 28636

Filed Apr. 2, 1985, Ser. No. 718,809
Int. Cl.[4] B27C 5/00
U.S. Cl. 144—1 C 11 Claims



1. In a multi-purpose woodworking machine of the type adapted for being converted into various woodworking devices such as a circular saw, lathe, drill press, disk sander, and the like, said device having a base; a horizontally extending support frame carried by said base; a drive motor mounted on said support frame for being adjustably moved to and maintained at selected positions along said horizontally extending support frame, said drive motor having a rotatable drive shaft extending generally horizontally; and an accessory seat carried by said base for receiving thereon various woodworking tools or accessories; the combination therewith of a carving adapter for converting the multi-purpose woodworking machine into a carving spindle for making individual and detailed carvings in wooden objects and the like; said carving adapter comprising:

a mounting platform carried by said accessory seat;

bearing means carried by said mounting platform;

an elongate rotatable shaft having a first portion extending from one end thereof to a medial location in said shaft and a second portion extending from said medial location to

the other end thereof, said first portion of the elongate shaft being rotatably received by said bearing means, and said second portion of the shaft projecting outwardly beyond said mounting platform and beyond the base of the multi-purpose woodworking machine so as to provide a wide clearance for manipulating the wooden objects during carving thereof;

means interconnecting said one end of said rotatable shaft with the drive shaft of said motor for thereby rotating the shaft upon operation of the motor; and

mounting means provided at said other end portion of said rotatable shaft for receiving thereon a cutting tool so that upon operation of the motor the cutting tool is rotated for carving wooden objects which are brought into engagement with the carving tool.

4,597,425

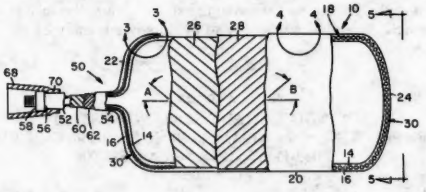
COLLAPSIBLE LIQUID STORAGE TANK

David N. Tally, 8991 W. Layton, Littleton, Colo. 80123

Filed Oct. 23, 1984, Ser. No. 664,123

Int. Cl.⁴ B65D *37/00, 85/72*

U.S. Cl. 150—55 **10 Claims**



1. In a liquid storage tank of the collapsible type with a generally thin-walled, elongate body having an elastomeric liner and cover that sandwich a twined reinforcement, the body having an intermediate tubular portion integrally interconnecting two opposite end portions in which one has an outlet, the improvement comprising:

the reinforcement in the tubular portion comprising twined cords extending at opposite helical angles that allow a radial growth of the tubular portion when pressurized, the reinforcement in each end portion comprising twined cords that are oriented to generally radially reinforce such end portion; and

a reinforced elastomer hose-like nozzle having a first end integrally connected to the outlet and a second end connected to a fitting, the nozzle having a sufficient length to position the fitting away from the body when the body is flattened and wherein the nozzle has a reinforcement that interconnects with the reinforcement of the connected end portion.

4,597,426

VEHICLE TIRE AND RIM HAVING TIRE BEAD ROTATABLE INTO ASSEMBLED CONDITION

Gerhard Mauk, Wunstorf; Heinrich Huinink, Garbsen; Hans Seitz; Udo Frerichs, both of Langenhagen; Heinz-Dieter Rach, Garbsen, and Dionysius Poqué , Aachen, all of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Nov. 25, 1983, Ser. No. 554,922

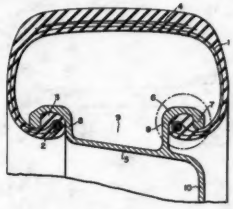
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1982, 3244046

Int. Cl.⁴ B60B *21/10*

U.S. Cl. 152—379.5 **8 Claims**

1. In combination, a vehicle wheel which has a rigid one-part rim, and a belted pneumatic tire which is adapted to be mounted on said rim; said tire having a carcass including a wall portion, two beads having bead edges, and in each bead a substantially inextensible core ring having a center of a cross-section thereof; said rim being provided with rim flanges having a minimum diameter and, adjacent thereto, having seating surfaces of the rim for said belted tire in assembled relation thereto; said rim flanges of said rim extending substantially radially inwardly; said rim having a radially inner periphery, with said seating surfaces of said rim for said tire being disposed adjacent to said rim flanges on said radially inner periphery; the improvement therewith comprising:

a central diameter of said core rings corresponding approximately to the minimum diameter of said rim flanges; in the mounted state of said tire as assembled on said rim, the distance "a" from the center of the cross-section of a given one of said core rings to that head edge of the associated



bead which faces the associated seating surface of the rim being greater than the distance "b" to the axially inner bead edge of that bead; so that during assembly said associated bead is rotated relative to the corresponding seating surface of the rim, and so that, during mounting of said tire when assembly further relative to the corresponding seating surface of the rim, said bead is slightly rotatable and/or pivotable in a 90° rotation from radial orientation into axial orientation of said bead edges so that the wall portion of said carcass in assembled condition is radially inwardly of said rim flanges.

4,597,427

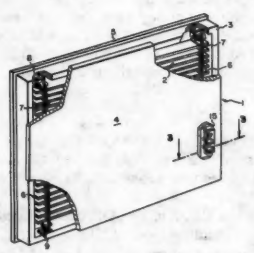
SHIPPING CLIP FOR LOCKING THE SLATS ON A VENETIAN BLIND ASSEMBLY AGAINST TILTING

Richard N. Anderson, Owensboro, Ky., assignor to Hunter Douglas Inc., Totowa, N.J.

Filed Apr. 18, 1984, Ser. No. 601,694

Int. Cl.⁴ E06B *3/32*

U.S. Cl. 160—107 **8 Claims**



1. A shipping clip for locking an operable element of a venetian blind assembly during shipment and/or installation of the assembly, and where the assembly includes said operable element being linearly movable and operatively connected to a tilt mechanism for tilting slats of the assembly and a guide means for guiding the operable element in a linear direction, said shipping clip having locking means thereon adapted to prevent relative movement between said operable movement and said guide means, and said operable element having a linearly extending slot therein and said guide means having a fixed portion extending through said slot to guide the element

during movement thereof, said locking clip having two linearly spaced stops thereon adapted to engage opposite ends of said fixed portion extending through said slot, and having engagement means thereon adapted to engage the ends of said slot.

4,597,428

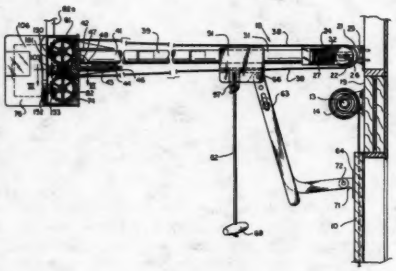
TWO DRUM CABLE DRIVE GARAGE DOOR OPENER

Kiyoshi Iha, Elk Grove Village, Ill., assignor to Chamberlain Manufacturing Corporation, Elmhurst, Ill.

Filed Feb. 1, 1984, Ser. No. 575,864

Int. Cl.[4] E05F *15/00*

U.S. Cl. 160—188 **6 Claims**



1. A garage door operator comprising, a pulley bracket adapted to be attached to a wall above a garage door, a pulley rotatably supported by said bracket, a motor and control unit, a tubular rail adjustably receivable in said pulley bracket and said motor and control unit, a cable, a first reel rotatably mounted in said motor and control unit and one end of said cable attached to said first reel, a second reel rotatably mounted in said motor and control unit and the second end of said cable attached to said second reel, said cable passing from said first reel over said pulley and to said second reel, a motor mounted in said motor and control unit coupled to simultaneously drive said first and second reels in opposite directions, and a trolley attached to said cable and connected to the garage door to move it between opened and closed positions, wherein bearings rotatably supported by said pulley in said bracket and said bearings are mounted so that they can move relative to said bracket, and spring means for spring biasing said berings and said pulley away from said motor and control unit and including an adjustment means in said motor and control unit so as to move the end of said rail relative to said motor and control unit to tighten said cable.

4,597,429

VERTICAL WINDOW BLIND SLATS

Edgar Driessen, Schlitz, Fed. Rep. of Germany, assignor to Bautex Adolf Stover Sohne KC, Langen, Fed. Rep. of Germany

Continuation of Ser. No. 379,435, May 18, 1982, abandoned. This application Dec. 13, 1984, Ser. No. 681,239

Claims priority, application Fed. Rep. of Germany, May 22, 1981, 3120364

Int. Cl.[4] E06B *9/36*

U.S. Cl. 160—236 **8 Claims**

1. A vertical window blind slat assembly comprising a vertical slat having opposite longitudinal edges and upper and lower edges, hanger means at the upper edge of the slat for suspending the slat vertically, said hanger means including two hanger components bearing against the upper edge of said slat respectively at said longitudinal edges, the upper edge of said slat apart from its engagement with said hanger components being left free, and weight means at the lower edge of said slat to impart stress in the slat, said weight means including two weight components bearing against the lower edge of said slat respectively at said longitudinal edges, the lower edge of said slat apart from its engagement with said weight components being left free, said weight components being respectively

aligned with said hanger components at the longitudinal edges of said slat to impart stress in the slat substantially only at said longitudinal edges whereby to avoid any tendency of the slat to twist.

4,597,430

WINDOW SHADE SEALING SYSTEM

Fidencio G. Marquez, 619 Ocean Blvd., Coronado, Calif. 92118

Filed Feb. 3, 1984, Ser. No. 576,906

Int. Cl.[4] E06B *9/17*

U.S. Cl. 160—269 **1 Claim**

1. A window shade sealing system for a window having a generally rectangular frame, with a window shade roller mounted at the top to enable the shade to be unrolled from the roll by pulling the leading edge, said system comprising:

(a) a pair of resilient side channels and means to fasten them to the sides of the window frames such as to capture the side edges of a shade as it is being pulled down into operative position;

(b) a lower baffle mounted to the bottom of the window frame to define a lip spaced from the window to provide a surface against which the lower edge of said shade seats;

(c) an upper baffle mounted to the upper portion of said window frame and having a continuous extending lip extending into adjacency with the rolled portion of said shade; and

(d) said lower baffle and upper baffle being identical in cross-section and resilient and each having a v-shaped cross sectional portion with one side substantially flat with an adhesive strip mounted thereon, and the other side flared to define an arc in cross section, width the arc being concave in substantially the opposite direction from said opening of v-shaped cross sectional portion and being shaped and dimensioned to be of greater radius than a rolled shade to permit the lip of said baffle opposite said v-shaped cross-sectional portion to continuously bear against the rolled shade as same decreases in radius as it is

unrolled, and to permit the same baffle to be used at the bottom of the shade, with said lip of said baffle contacting the leading edge of said shade.

4,597,431

MELTING AND PRESSURE CASTING DEVICE

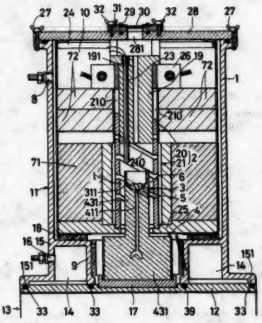
Sumiya Hobo, Tokyo; Toshio Shimizu, and Masaru Nishida, both of Kyoto, all of Japan, assignors to Kyocera Corporation, Japan

Filed Dec. 26, 1984, Ser. No. 686,292

Claims priority, application Japan, Dec. 28, 1983, 58-246548; May 24, 1984, 59-106008

Int. Cl.⁴ B22D *18/00*

U.S. Cl. 164—253 **13 Claims**



11. A casting device comprising:

a first chamber having a heating element;

a second chamber;

means for maintaining the relative position of said first and second chambers;

a platform having a surface thereon, said surface having a first portion capable of forming a substantially air-tight seal with said first chamber and a second portion capable of forming a substantially air-tight seal with said second chamber;

means for reducing pressure within said second chamber when said second portion of said surface forms said seal with said second chamber,

whereby the pressure differential created by said reduced pressure maintains said surface against said first chamber and said second chamber.

4,597,432

MOLDING DEVICE

Richard J. Collins; Frank E. Wagstaff, and William G. Wagstaff, all of Spokane, Wash., assignors to Wagstaff Engineering, Inc., Spokane, Wash.

Continuation of Ser. No. 258,520, Apr. 29, 1981, abandoned. This application Jun. 11, 1984, Ser. No. 618,778

Int. Cl.⁴ B22D *11/124*

U.S. Cl. 164—444 **69 Claims**

1. In a metal molding device,

a coolant box, inside surfaces of which define the relatively top, bottom and side walls of an enclosed chamber adapted for the flow of liquid coolant through the box,

the top of said chamber having an opening therein on a vertical axis of the box,

a top opening mold cavity defining member,

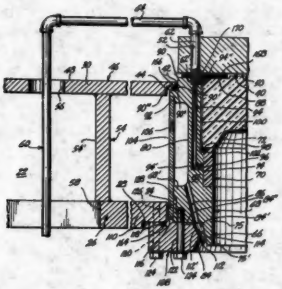
means on the bottom of the box whereby the mold cavity defining member is insertable in the chamber on the axis,

support means adjacent the bottom of the chamber whereby the member is supportable in the box in a telescoping assembly in which the top opening of the member is coaxial with the top opening of the chamber to enable molten metal to be introduced to the cavity of the member through the respective top openings of the chamber and the member,

said mold cavity defining member having a greater outer peripheral diameter transverse the axis than the top opening of said member,

first means on the mold cavity defining member and the box forming a first line of engagement between the member and the defining surfaces of the chamber in which a top surface of the member about the opening thereof engages the top of the chamber about the opening thereof in a first horizontal plane of the box,

second means on the mold cavity defining member and the box forming a second line of engagement between the



member and the defining surfaces of the chamber about the aforesaid top surface of the member, said second line of engagement being formed in a second horizontal plane of the box which is spaced below the aforesaid first horizontal plane of the box by a vertical gap, and being adapted to forestall liquid coolant from entering the cavity of the member along the top surface thereof,

and means associated with the box for discharging liquid coolant from the chamber, said coolant discharge means being disposed so that any liquid coolant which leaks into the gap through the second line of engagement is discharged from the gap at a level below the aforesaid first horizontal plane of the box and to a point outside of the chamber at which the leakage cannot reach the cavity of the member along the aforesaid top surface thereof.

4,597,433

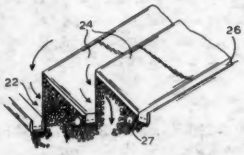
POLLUTION CONTROL AND HEAT RECOVERY

Arthur F. Johnson, Boulder, Colo., assignor to Energy Conservation Partnership, Ltd., Boulder, Colo.

Filed Aug. 9, 1984, Ser. No. 639,307

Int. Cl.⁴ F28D *17/00*; F28F *19/00*

U.S. Cl. 165—4 **6 Claims**



1. A heat regenerator for fossil fuel flue gases comprising:

a massive bed of sized, acid-resistant aggregate, said aggregate being contained within acid-resistant walls, a roof and support structure, individual aggregate pieces being of sufficient size to avoid large pressure drops within said

bed and provide myriad tortuous paths for cooling flue gases flowing therethrough;

said bed being of sufficient horizontal cross-section to reduce the velocity of said flue gas to a point where substantial particulates quickly lose suspension;

support means for collecting the substantial particulates before entering the top of the bed;

first means for removing said substantial particulate from the support means before entering the top of said bed;

second means for removing fine particulates and condensates near the bottom of said bed; and

said bed being constructed to withstand repeated thermal cycling within the range of at least 50° to 350° F.

4,597,434

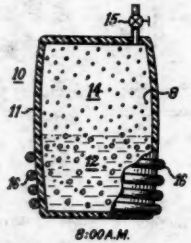
SOLAR ENERGY STORAGE CELL

Richard A. Menelly, 87 Belden Rd., Burlington, Conn. 06013

Filed Sep. 20, 1984, Ser. No. 652,271

Int. Cl.⁴ F28D *21/00*

U.S. Cl. 165—10 **24 Claims**



1. A thermal storage cell comprising:

a container for exposing to a source of heat;

a first material having a heat of adsorption of at least 100 BTU/LB within said container for receiving said heat, said material being saturated with a quantity of adsorbed liquid, at a first temperature less than 100° F., said liquid becoming desorbed within said container when said first material is receiving said heat at a temperature in excess of 100° F. but less than the boiling point of said liquid and said liquid becoming readsorbed within said first material in the absence of said heat to thereby release said heat as heat of adsorption.

17. A thermal storage cell comprising:

a container for exposing to a source of heat;

a first material within said container for receiving said heat, said first material containing a quantity of adsorbed liquid, said liquid becoming desorbed within said container when said first material is receiving said heat and said liquid becoming readsorbed within said first material in the absence of said heat to thereby release said heat;

a second material having a heat of adsorption less than said first material for receiving said liquid from said first material when said first material is receiving heat and for releasing said liquid to said first material when said first material is not receiving heat; and

a heat reflecting surface on an exterior of said container proximate said second material.

4,597,435

BOTTLE WARMER OR COOLER

Benjamin P. Fosco, Jr., 5461 N. Monitor St., Chicago, Ill. 60630

Filed Jan. 9, 1985, Ser. No. 690,115

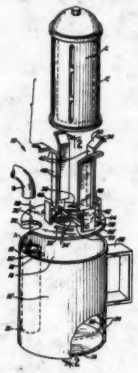
Int. Cl.⁴ F28F *9/22, 9/24*

U.S. Cl. 165—80.5 **17 Claims**

1. A portable device for selectively heating or cooling a bottle by heat exchange with a fluid, comprising:

A. a container for holding said bottle in contact with said fluid, said container having an enclosing wall upstanding from a closed bottom end thereof and having an open, upper end thereof;

B. a platform means positioned within said container above said bottom end for supporting the bottle in spaced relation thereto, said platform means dividing the interior of the container into an upper chamber for holding said bottle and a lower chamber between said platform means and said bottom end for distribution of said fluid, said platform means having at least one passageway oriented upwardly therethrough for directing upward passage of said fluid from said



lower chamber into said upper chamber to contact said bottle during upward flow of the fluid through the container; and

C. a conduit means communicating with said lower chamber and defining a flow path separated from said upper chamber for supplying said fluid to said lower chamber, said conduit means including an upstanding tube positioned within said container, said tube having an opening formed at the upper end thereof for entry of fluid downwardly flowing through said tube into said lower chamber.

4,597,436

TUBULAR DISTRIBUTOR ARRANGEMENT FOR A HEAT COLLECTOR VESSEL

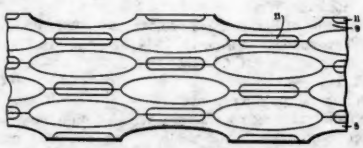
Klaus Hagemeister, Manzostrasse 28B, D-8000 Munich 50, and Alfred Hueber, Nebelhornstrasse 4, D-8901 Mercking, both of Fed. Rep. of Germany

Filed Nov. 15, 1983, Ser. No. 551,725

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1982, 3242844; Mar. 19, 1983, 3310061

Int. Cl.⁴ F28F *7/00, 9/02*

U.S. Cl. 165—76 **11 Claims**



1. A tubular distributor comprising a hollow collector vessel including a wall defining an internal chamber, a plurality of tubes extending through said wall into communication with said chamber, said wall comprising a plurality of pre-profiled elements of substantially identical plan form mounted in superimposed relation on one another to collectively form said wall, each pre-profiled element having upper and lower surfaces and opposite end surfaces, the elements being superimposed with the lower element to form superimposed surfaces in successive

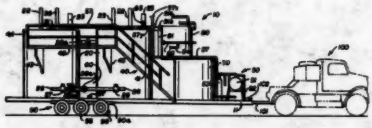
substantially common planes, said elements having first recesses in said upper and lower surfaces which respectively and cooperatively form apertures for said tubes when said elements are superimposed on one another, said recesses in the upper and lower surfaces of each element being respectively offset from one another and respectively receiving one-half of the cross-section of corresponding tubes, and means at the adjoining surfaces of said elements with one another and with said tubes for preventing entry of fluids therebetween, said upper and lower surfaces of said pre-profiled elements being provided with second recesses, said second recesses extending from a first one end surface of each element partially through said element towards the other of said end surfaces such that when said elements are superimposed the second recesses of superimposed elements come into registry and form bling openings which open externally of said wall at said first one end surface of said elements.

4,597,437

PORTABLE PRODUCTION PACKAGE FOR OIL AND GAS WELLS

Stephen L. McNabb, Rte. 1, Millersburg, Ohio 44654

Filed Apr. 16, 1984, Ser. No. 600,540
Int. Cl.[4] E21B *43/00*
U.S. Cl. 166—79 **17 Claims**



1. A portable, self contained production package for use with a hydrocarbon producing well and a gas removal line to perform all necessary initial on site processing, comprising:

(A) a rigid frame including a parallelogram of at least two opposite elongate beam members and a plurality of transverse structural members of lesser length than said elongate beam members secured between said beam members;

(B) at least one oil storage tank secured to the top of said at least two beam members of said frame and at least one of said transverse structural members;

(C) separator means mounted on said frame;

(D) control and metering means mounted on said frame

(E) plumbing means interconnecting the well, said control means, said oil storage tank and said separator means;

(F) first connection means included in said plumbing means and disposed between said separator means and the well for releasable attachment to said well; and

(G) second connection means included in said plumbing means and disposed adjacent said separator means for releasable connection with the gas removal line.

4,597,438

SWIVEL BAR APPARATUS FOR USE WITH STEEL AND OTHER TYPES OF SUCKER RODS

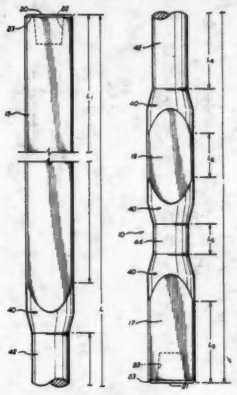
Donald W. Bennett, P.O. Box 6008, Odessa, Tex. 79762

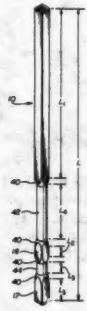
Filed Sep. 30, 1983, Ser. No. 537,870
Int. Cl.[4] E21B *43/00*
U.S. Cl. 166—105 **2 Claims**

1. A sinker bar for use in a well bore with a plurality of sucker rods, the sinker bar comprising;

an elongated body member of suitable diameter for introduction into the well bore or into tubular members lining the well bore,

at least half of the body member having a substantially square cross section and each end of the body member having a substantially square cross section, and





the ends of the body member having connection means for connecting the sinker bar to adjacent members in the well bore.

4,597,439

FULL-BORE SAMPLE-COLLECTING APPARATUS

Dale E. Meek, Missouri City, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Jul. 26, 1985, Ser. No. 759,631
Int. Cl.[4] E21B *49/08*
U.S. Cl. 166—163 **16 Claims**

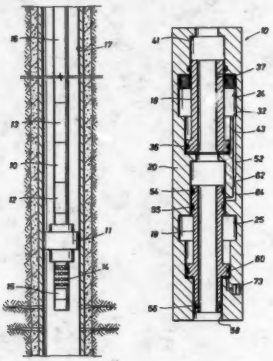
1. A well tool adapted to be connected in a pipe string and positioned in a well bore for collecting a sample of connate fluids flowing inside of the pipe string and comprising:

inner and outer tubular members telescopically arranged together for longitudinal movement of said inner member between spaced first and second positions and cooperatively defining an annular sample chamber therebetween adapted to receive a fluid sample when said inner member is in its said first position and adapted to trap that sample therein when said inner member is in its said second position;

first means selectively operable from the surface for admitting a fluid sample into said sample chamber when said inner member is in its said first position;

second means operable only upon admission of a fluid sample into said sample chamber for regulating the rate at which that sample fills said sample chamber; and

third means operable only upon filling of said sample chamber with a fluid sample for moving said inner member to



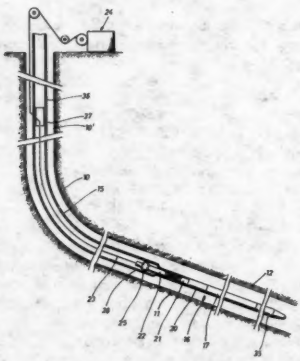
its said second position to trap that sample in said sample chamber.

4,597,440

METHOD AND APPARATUS FOR DISPLACING LOGGING TOOLS IN DEVIATED WELLS

Alain P. Pottier, Houston, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Apr. 4, 1985, Ser. No. 719,668
Int. Cl.[4] E21B *47/12, 23/00*
U.S. Cl. 166—250 **6 Claims**



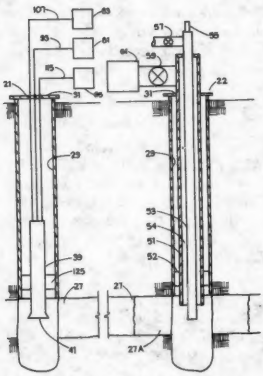
1. A method for displacing a logging tool through a non-gravity descent portion of a well, comprising the steps of providing a logging tool at the lower end of a drill pipe as an exposed extension to said drill pipe, displacing the tool thus exposed through the non-gravity descent portion of the well by connecting additional sections of drill pipe and lowering the drill pipe, and, during this displacing step, continuously generating and sending uphole a signal indicative of the compressive load undergone by the tool.

4,597,441

RECOVERY OF OIL BY IN SITU HYDROGENATION

Charles H. Ware, Roanoke; Leslie C. Rose, Rocky Mount, both of Va., and Joseph C. Allen, Bellaire, Tex., assignors to World Energy Systems, Inc., Fort Worth, Tex.

Filed May 25, 1984, Ser. No. 614,044
Int. Cl.[4] E21B *43/24, 43/243*
U.S. Cl. 166—261 **41 Claims**



1. A method of recovering petroleum from underground formations penetrated by a production well, comprising the steps of:

by way of said well, injecting into an underground formation zone next to said well, superheated steam at a temperature within a range of from about 350° F. to about 900° F.,

reducing the amount of superheated steam injected and injecting into said underground formation zone bydrogen having a temperature within a range of from about 350° F. to about 900° F.,

continuing to inject said hydrogen until sufficient pressure is achieved to cause hydrogenation of the petroleum in said formation zone,

terminating the injection of said hydrogen,

recovering fluids including petroleum from said formation zone by way of said well,

by way of another well penetrating said formations and spaced from said production well, injecting into said formations, fluid to drive fluids including petroleum in said formations between said other well and said production well, to said production well,

said petroleum in said formations between said other well and said production well being driven through said formation zone, while said formation zone is in a heated condition and in the presence of hydrogen therein to cause hydrogenation of said petroleum as it is being driven through said formation zone to said production well,

injecting additional hydrogen into said formation zone by way of said production well to enhance hydrogenation of said petroleum as it is being driven through said formation zone to said production well, and

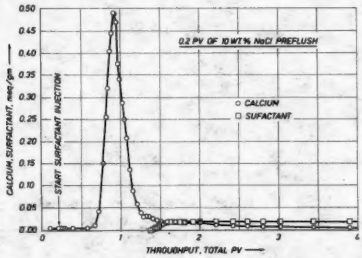
by way of said production well, recovering said petroleum driven to said production well.

4,597,442

RESERVOIR PREFLUSHING PROCESS FOR INCREASING THE RATE OF SURFACTANT TRANSPORT IN DISPLACING OIL WITH INJECTED STEAM AND STEAM-FOAMING SURFACTANT

Richard E. Dilgren; Hon C. Lau, and George J. Hirasaki, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 26, 1985, Ser. No. 705,773
Int. Cl.[4] E21B *43/22, 43/24*
U.S. Cl. 166—272 **10 Claims**



1. In a process in which oil is displaced by injecting steam and steam-foaming surfactant into a reservoir in which the transporting of steam-foaming surfactant is impeded by a tendency of the reservoir rocks to exchange multivalent cations for monovalent cations in the injected aqueous liquid component of that mixture, an improvement comprising:

pretreating the reservoir, before injecting at least a portion of the steam and steam-foaming surfactant mixture, by injecting an effective volume of preflush aqueous liquid solution containing both a proportion of dissolved monovalent cation salt that exceeds the monovalent cation concentration which is effective for exchanging monvalent cations for multivalent cations on the reservoir rocks and an interfacial tension lowering surfactant, so that the preflush solution displaces multivalent cations out of the zone to be swept by steam and steam-foaming surfactant; and

subsequently injecting a mixture of steam and steam-foaming surfactant into a relatively multivalent cation-depleted portion of the reservoir which was contacted by the preflush solution.

4,597,443

VISCOUS OIL RECOVERY METHOD

Winston R. Shu, Dallas, and Kathy J. Hartman, Arlington, both of Tex., assignors to Mobile Oil Corporation, New York, N.Y.

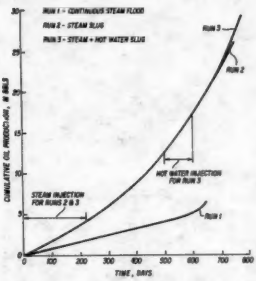
Continuation-in-part of Ser. No. 320,236, Nov. 12, 1981, abandoned. This application Nov. 14, 1983, Ser. No. 551,435
Int. Cl.[4] E21B *43/24*
U.S. Cl. 166—272 **9 Claims**

1. A steam slug method for the recovery of oil from a subterranean, viscous oil-containing formation penetrated by at least one injection well and a spaced apart production well comprising:

(a) injecting a predetermined amount of steam having a quality of 50% to 90% at an injection rate within the range of 4 to 7 barrels of steam (cold water equivalent) per day per acre-foot of formation into the formation via said injection well and recovering fluids including oil from the formation via said production well;

(b) thereafter shutting-in said injection well and continuing to recover fluids including oil from the production well but without steam breakthrough until the pressure at the production well declines to a value within the range of one-third to two-thirds of said pressure at the time said injection well is shut-in;

(c) thereafter injecting a predetermined amount of a thermal recovery fluid comprising hot water or low quality steam into the formation via said injection well; and


Run 1 = CONTINUOUS STEAM FLOOD
Run 2 = STEAM SLUG
Run 3 = STEAM + HOT WATER SLUG
Run 3
Run 2
HOT WATER INJECTION FOR RUN 3
STEAM INJECTION FOR RUNS 2 & 3
Run 1
CUMULATIVE OIL PRODUCTION, % BIIP
TIME, DAYS

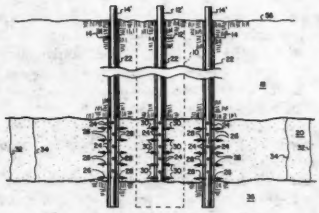
(d) continuing to recover fluids including oil from the formation via said production well until the recovered fluids contain an unfavorable amount of steam or water.

4,597,444

METHOD FOR EXCAVATING A LARGE DIAMETER SHAFT INTO THE EARTH AND AT LEAST PARTIALLY THROUGH AN OIL-BEARING FORMATION

Thomas S. Hutchinson, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sep. 21, 1984, Ser. No. 653,103
Int. Cl.[4] E21B *36/00, 43/24, 43/30*
U.S. Cl. 166—302 **11 Claims**



1. A method for positioning a large diameter shaft from the surface into the earth and at least partially through a subterranean oil-bearing formation, said method comprising

(a) Positioning a central well near the center of a selected shaft location, said central well extending at least partially through said oil-bearing formation;

(b) Positioning a plurality of wells at a selected distance outside the diameter of said shaft and about said shaft, said wells extending at least partially through said oil-bearing formation;

(c) Injecting a fluid through at least a portion of said wells into said oil-bearing formation to remove oil from said oil-bearing formation;

(d) Producing fluids from said central well;

(e) Injecting water into said oil-bearing formation through said portion of said wells after the injection of said fluid through said portion of the said wells;

(f) Freezing a zone about said location; and,

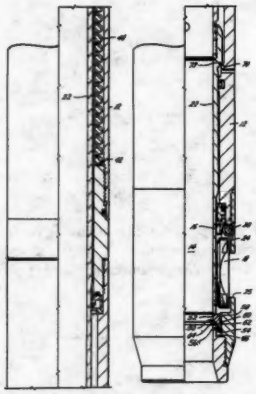
(g) Excavating said shaft.

4,597,445

WELL SUBSURFACE SAFETY VALVE

Richard H. Knox, Spring, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed Feb. 19, 1985, Ser. No. 702,980
Int. Cl.[4] E21B *34/10*
U.S. Cl. 166—319 2 Claims



1. A well subsurface safety valve comprising,
a housing having a bore,
a flapper valve closure member in the bore moving between open and closed positions,
a tubular member telescopically movable in the housing for controlling the movement of the valve closure member,
means for moving the tubular member downwardly for opening the valve closure member,
biasing means contacting the tubular member for moving the tubular member upwardly for allowing the valve member to close,
coacting engaging shoulders on the tubular member and said housing spaced from the lower end for limiting downward movement of the lower end of the tubular member,
a movable resilient and non-metallic seal means telescopically movable in the housing and positioned in the path of travel of the lower end of the tubular member,
stop means between the housing and the seal means limiting the extent of travel of the seal means in the upper and lower directions, and
spring means between the housing and the movable seal means for urging the seal means toward the tubular member for sealing against the lower end of the tubular member when the valve is in the open position.

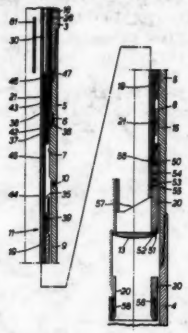
4,597,446

SAFETY VALVES FOR WELLS

Paul M. Helderle, Boulogne, France, assignor to Compagnie Francaise des Petroles, Paris Cedex, France

Filed Nov. 23, 1983, Ser. No. 554,731
Claims priority, application France, Nov. 29, 1982, 82 19954
Int. Cl.[4] E21B *34/10*
U.S. Cl. 166—322 19 Claims

1. A safety valve, comprising; a valve body of generally cylindrical shape and having, in use, an upper end and a lower end, shut-off means near the lower end of said body, a cylindrical block longitudinally slidable within said body and being movable relative to said body to open said shut-off means, locking means located in radially outer portions of said body and comprising a radially expandable attachment component for engaging, when expanded, a stop groove provided outside said body, and upper and lower sealing means arranged in radially outer portions of said body for defining therebetween a space for receiving a control fluid, said upper and lower sealing means being arranged longitudinally one on each side



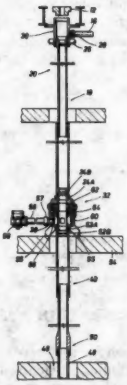
of said locking means, such that said locking means are located in said space for receiving said control fluid.

4,597,447

DIVERTER/BOP SYSTEM AND METHOD FOR A BOTTOM SUPPORTED OFFSHORE DRILLING RIG

Joseph R. Roche, Humble; Gabriel G. Alexander, Houston, and William L. Carbaugh, Humble, all of Tex., assignors to Hydril Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 556,626, Nov. 30, 1983, Pat. No. 4,524,832. This application May 11, 1984, Ser. No. 609,506
The portion of the term of this patent subsequent to Jun. 25, 2002, has been disclaimed.
Int. Cl.[4] E21B *17/01, 17/07, 33/038, 33/076*
U.S. Cl. 166—347 48 Claims



1. A system adapted for alternative use as a diverter or a blowout preventer for a bottom supported drilling rig and adapted for connection to a permanent housing attached to rig structural members beneath a drilling rig rotary table, the permanent housing having an outlet connectable to a rig fluid system flow line, the system comprising
a fluid flow controller having
a controller housing with a lower cylindrical opening and an upper cylindrical opening and a vertical path therebetween and a first outlet passage and a second outlet passage provided in its wall,
a packing element disposed within the controller housing, and

annular piston means adapted for moving from a first position to a second position, whereby in the first position the piston means wall prevents interior fluid from communicating with the outlet passages in the controller housing wall and in the second position the piston means wall allows fluid communication of interior fluid with the outlet passages and urges the annular packing element to close about an object extending through the bore of the controller housing or to close the vertical flow path through the controller housing in the absence of any object in the vertical flow path,

means for connecting a vent line to said first outlet passage provided in the controller housing wall,

a lower telescoping spool having a lower joining means at its lower end for joining alternatively to structural casing or to a mandrel connected to a conductor string cemented within the structural casing and an upper connection means at its upper end for connection to the lower cylindrical opening of the fluid flow controller, and

an upper telescoping spool having a lower connection means for connection to the upper cylindrical opening of the fluid flow controller.

10. A method for installing a system adapted for alternative use as a diverter or a blowout preventer for a bottom supported drilling rig beneath a permanent housing attached to rig structural members supporting a drilling rig rotary table after structural casing has been set in a borehole, the method comprising the steps of,

lowering through the rotary table a collapsed and pinned spool having a lower joining means at its lower end and an upper connector means at its upper end,

joining the lower joining means at the lower end of the lower spool to the structural casing in the borehole,

moving a fluid flow controller having a first housing wall outlet and a second housing wall outlet and adapted for alternative use as a diverter or a blowout preventer to a drilling rig subsupport structure beneath the rotary table and fastening the controller to the subsupport structure after the controller is substantially aligned with a bore of the rotary table above and the lower telescoping spool below,

unpinning and stroking the lower telescoping spool out until the connector means at its upper end connects with the lower end of the controller,

lowering through the rotary table a collapsed and pinned upper telescoping spool having a lower connector means at its lower end and connecting the upper spool to the upper end of the controller by means of its lower connector means, and

unpinning and stroking the upper telescoping spool out until the upper end of the upper telescoping spool connects with the permanent housing.

4,597,448

SUBSEA WELLHEAD SYSTEM

Benton F. Baugh, Houston, Tex., assignor to Smith International, Inc., Newport Beach, Calif.

Division of Ser. No. 348,735, Feb. 16, 1982. This application Nov. 30, 1983, Ser. No. 546,530

Int. Cl.[4] E21B *33/043*

U.S. Cl. 166—348 **13 Claims**

1. A method of completing an underwater well comprising the steps of:

(a) locating drilling means at an underwater well site;

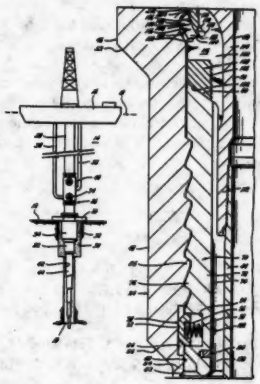
(b) installing conductor casing in the floor of a body of water with a wellhead, blowout preventer stack, and riser attached thereto at a point near the floor, the riser extending upwardly to said drilling means;

(c) running a drill string and standard 17½ inch drill bit through the wellhead and conductor casing;

(d) drilling a hole for suspending another casing within the wellhead and conductor casing;

(e) lowering a hanger seat into the well until the seat lands in the wellhead;

(f) rotating the hanger seat less than 360° to connect the hanger seat within the wellhead;



(g) latching the hanger seat within the wellhead;

(h) running a casing hanger with the other casing through the riser and into the wellhead; and

(i) landing the casing hanger on the hanger seat.

4,597,449

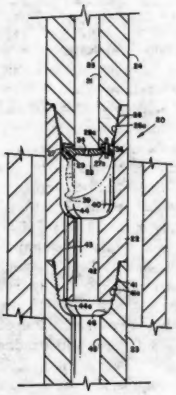
METHOD AND APPAPARATUS FOR PREVENTING FLUID RUNOVERS FROM A WELL

L. W. Keeney, 1001 ½ Hollywood, Farmington, N. Mex. 87401

Filed Apr. 20, 1984, Ser. No. 602,547

Int. Cl.[4] E21B *34/14*

U.S. Cl. 166—373 **17 Claims**



1. An apparatus for preventing the uncontrolled passage of fluids through a well comprising:

a housing having a passageway therethrough;

a valve in said passageway having a passageway therethrough of sufficient size to permit the passage of a wireline tool therethrough and including a valve closure means operable in a first position to close said valve to prevent the passage of fluid and in a second position to allow the passage of fluid and a wireline tool; and

means on said valve closure means operable to bias said valve closure means towards said second position when engaged by said wireline tool being withdrawn from the well through the passageway in said valve.

17. A method for preventing fluid overrun when running washover pipe comprising:

running washover pipe into a well bore;

allowing fluid to flow upwardly through said well bore at a controlled rate;

opening a valve closure member in response to movement of a wireline tool into said well bore; and

moving said valve closure member out of the passageway to allow upward movement of said wireline tool out of said well bore.

4,597,450
FIRE-PROOF COVER AND ITS USE

Hermann Budmiger, Muhlematt 114, CH-4206 Seewen, Switzerland

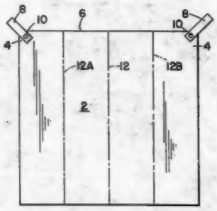
PCT No. PCT/CH82/00018, § 371 Date May 25, 1984, § 102(e) Date May 25, 1984, PCT Pub. No. WO84/01301, PCT Pub. Date Apr. 12, 1984

PCT Filed Feb. 22, 1983, Ser. No. 619,594

Claims priority, application Switzerland, Sep. 27, 1982, 5669/82

Int. Cl.[4] B65D *85/00*; A62C *7/00*

U.S. Cl. 169—50 **5 Claims**



1. A fire protecting set comprising a rectangular fire-proof cover having horizontal and vertical dimensions and having an upper edge and two adjoining upper corners, said cover being provided with two handling bands each attached to said cover at a point adjacent said upper edge of said cover adjacent an associated one of said two upper corners of said cover, said cover being made of a substantially gas-tight glass fiber textile and being so folded as to form a packet in which said handling bands are located adjacent to one another and such that when said handling bands are pulled apart as far as possible said cover is immediately spread to its full horizontal dimension without the need for any other manipulation of said cover or said bands, and a bag-like package containing said packet, said package being of generally rectangular shape with four sides, said package having a hanging device attached to it adjacent one of its sides and having a tearable line of weakening extending along three of said sides, said handling bands extending through said package at one point along said tearable line of weakening so as to be graspable by a user from outside of said package, the spreading of said bands and said cover when said bands are grasped and pulled apart causing said package to tear along said line of weakening to separate said cover from said package without any holding force having to be applied to said package, said cover being made of glass fiber roving with the glass fibers of said roving consisting of a glass whose transformation temperature T_g is about 1250 degrees Centigrade and which has a softening interval of several hundred degrees Centigrade, preferably from 850 degrees Centrigrade to 1250 degrees Centigrade.

4,597,451
FIRE AND EXPLOSION DETECTION AND SUPPRESSION

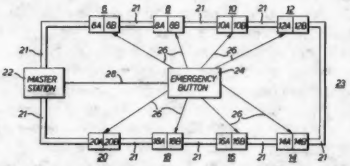
Peter E. Moore, Reading, and David H. J. Davies, Marlow, both of England, assignors to Graviner Limited, Slough, England

Filed Sep. 5, 1984, Ser. No. 647,566

Claims priority, application United Kingdom, Sep. 9, 1983, 8324136

Int. Cl.[4] A62C *37/04*

U.S. Cl. 169—61 **10 Claims**



1. A fire detection and suppression system, comprising a plurality of fire detection-suppression means for distribution within an area to be protected, each fire detection-suppression means including fire detection means for producing a first control signal in response to the detection of a fire condition exceeding a first but not a second threshold and a second control signal in response to a fire condition exceeding the second threshold and each fire detection-suppression means including fire suppression means connected to release a fire suppressant in response to the respective second control signal, and master control means connected to all the fire detection-suppression means to receive the control signals therefrom and operative in response to receipt of a said second control signal from any one of said fire detection-suppression means to cause release of the fire suppressant by any other of said fire detection-suppression means which is both adjacent to said one fire detection-suppression means and producing a said first control signal.

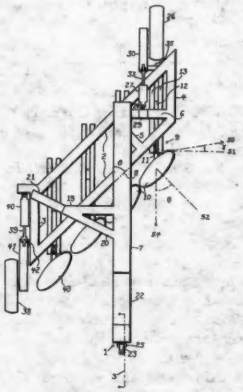
4,597,452
DISK GRADING TERRACE PLOW

Ralph M. Tapphorn, and David E. Tapphorn, both of R.R. 1 Box 2B, Grinnell, Kans. 67738

Filed May 6, 1985, Ser. No. 731,007

Int. Cl.[4] A01B *13/02*; E02F *5/02*

U.S. Cl. 172—574 **3 Claims**



1. A grading device comprising;

(a) an angled beam frame, comprising two parallel angled beams connected at each of the extreme ends by a longitudinal beam, which said angled beam frame is fixedly mounted to an elevated hitch beam for towing via a tractive vehicle in which the said angled beam frame is aligned between 40 and 45 degrees to the direction of tow, a grading device having a plurality of disk units fixedly mounted to the lower side of said angle beam frame at closely adjacent lateral positions along the angled beam thereof which permit a furrow to be excavated with each said disk unit and discharged laterally and rearwardly in a compound grading manner in front of the next sequential rearward disk unit as the device is towed forward thereby grading dirt laterally across the device and around the rearmost disk unit;

(b) said dirt compounding disk units each comprising a concave disk blade removably connected via plow bolt to a disk socket plate in which the said disk socket plate is fixedly mounted to an L-shaped vertical shank at an angled position to the direction of intended tow such that a representative tangential vector emanating from the edge of said disk blade in the direction of discharge for the dirt from said disk blade is at a rearward angle of 5 to 15 degrees from an orthogonal plane to the direction of tow, the said L-shaped vertical shank including a brace strut is connected removably to a pair of parallel L beams mounted to a lower side of said angled beam frame;

(c) a forward gauge wheel mounted outside the longitudinal beam of said angle beam frame, having hydraulic power adjustment means for elevating the forwardmost end of said angled beam frame above the ground level thereby controlling the excavating depth and grading slope of said grading device;

(d) a rear gauge wheel mounted to the rear of said angled beam frame and directly in line with the excavated furrow cut by said rearmost disk unit, having hydraulic power adjustment means for elevating the rearwardmost end of said angled beam above the ground level thereby controlling the excavating depth of said grading device;

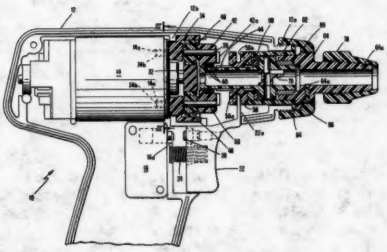
a swivelled hitch secured to said longitudinal beam for connecting the grading device to a towing vehicle.

4,597,453

DRIVE UNIT WITH SELF-ALIGNING GEARING SYSTEM

Paul R. Kilmer, Leroy, Mich., and David S. Chapin, Raleigh, N.C., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Feb. 8, 1985, Ser. No. 699,931
Int. Cl.[4] B21F *15/04*
U.S. Cl. 173—171 **11 Claims**



1. A motor output drive for a power tool comprising, in combination:

a motor driven output gear rotatable about an output axis;

a drive shaft rotatably supported at a first end in a bearing establishing an axis of rotation which is fixed with respect to the case of said power tool;

idler gear means coupled to said drive shaft at an end opposite said first end, said idler gear means including a carrier plate and a plurality of idler gears which engage said output gear and which are rotatably mounted on pins fixed to said carrier plate at locations on a circle concentric with said output axis;

non-rotatable ring gear means having teeth positioned on a ring concentric with said output axis and engaging the teeth of said idler gears, whereby said idler gears rotate about their mounting pins in response to rotation of said output gear causing the rotation of said output gear to be transmitted to said drive shaft at a reduced angular velocity; and

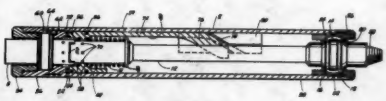
suspension means supporting said ring gear means in a radially floating position such that said idler gear means acts in response to centrifugal force to seek a center of rotation aligned with said output axis.

4,597,454

CONTROLLABLE DOWNHOLE DIRECTIONAL DRILLING TOOL AND METHOD

William N. Schoeffler, 218 W. Bridge St., Breaux Bridge, La. 70517

Filed Jun. 12, 1984, Ser. No. 619,866
Int. Cl.[4] E21B *7/04*
U.S. Cl. 175—61 **9 Claims**



1. A tool for controllable, directional drilling in a deep bore well comprising:

a. an elongate, outer, orientable casing member, aligned in said bore;

b. an inner, bendable, torque passing member adapted for rotation of a drill bit, journaled within said outer casing member;

c. means for deflecting, with respect to the orientation of the outer casing member, the inner bendable torque passing member; and

d. means having a first coupled position, coupling the outer casing member and said inner bendable member, and a second uncoupled position disconnecting the outer casing member and the inner bendable member.

9. A method for directional drilling comprising:

a. providing an outer, rotationally alignable, bore contacting alignment means;

b. providing an inner deflectable drive means having a first straight line and a second curve driving position;

c. providing means for rotationally coupling and uncoupling the outer, rotationally alignable bore contacting alignment means and inner deflectable drive means;

d. rotatably connecting a drill bit to said deflectable drive means, angularly responsive to said deflection;

e. aligning said outer means to establish an azmuth of said drilling direction; and

f. deflecting said drive means to establish an offset drill arc angle along said azmuth.

4,597,455

ROCK BIT LUBRICATION SYSTEM

D. F. Walters, Midlothian; David T. Brunson, Arlington, and William R. Bell, Dallas, all of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 3, 1985, Ser. No. 719,613
Int. Cl.[4] E21B *10/22*
U.S. Cl. 175—228 **5 Claims**

1. An improved rotary rock bit having a pressure compensated sealed lubrication system including:

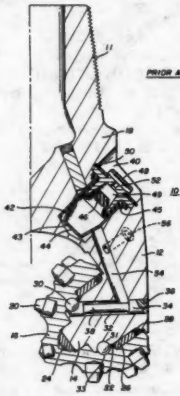
a bit body having at least one downwardly extending leg terminating in a projecting axle portion having an inwardly downwardly directed axis;

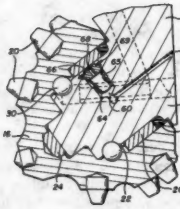
cutter means rotatably mounted on said axle portion and defining an internal cavity for receipt therein of said axle portion;

bearing means disposed within said cavity for rotary load bearing engagement between said axle portion and said cutter;

seal means disposed between said cutter and said axle portion to seal said cavity and the bearings therein from external ambient fluids said sealed cavity substantially filled with lubricant;

pressure compensated lubrication means for supplying lubri-





cant from a reservoir to said cavity including a flexible diaphragm member responsive to external fluid pressure to transmit said pressure to said lubricant and wherein the improvement comprises:

lubricant reservoir means defining a chamber in said axle portion providing a lubricant-containing portion in flow communication with said bearing cavity at one end, said chamber closed at the opposite end by said diaphragm member; and means defining a flow path from a side of said diaphragm opposite said lubricant-containing portion to said external ambient fluids;

whereby said external fluid pressure is transmitted through said diaphragm member and the lubricant in said chamber and bearing cavity to the back face of said seal and replenish lubricant in said bearing means.

4,597,456

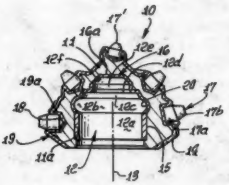
CONICAL CUTTERS FOR DRILL BITS, AND PROCESSES TO PRODUCE SAME

Gunes M. Ecer, Irvine, Calif., assignor to CDP, Ltd., Newport Beach, Calif.

Filed Jul. 23, 1984, Ser. No. 633,635

Int. Cl.[4] E21B *10/08*

U.S. Cl. 175—371 **27 Claims**



1. A roller bit cutter, comprising, in combination:

(a) a tough, metallic generally conical and fracture resistant core having a hollow interior, the core defining an axis,

(b) an annular metallic radial bearing layer carried by said core at the interior thereof to support the core for rotation, said bearing layer extending about said axis,

(c) an impact and wear resistant metallic inner layer on the core, at the interior thereof, to provide an axial thrust bearing, and

(d) hard metallic inserts having anchor portions carried by the core and partly embedded therein the inserts protruding outwardly at the exterior of the core to define cutters, at least some of the inserts spaced about said axis,

(e) and a wear resistant outer metallic layer on the exterior of said core,

(f) said core defining multiple recesses reciving said insert anchor portions, said outer metallic layer extending into said recesses and between the core and said insert anchor portions,

(g) said outer layer consolidated under pressure in situ to look to and about the anchor portions of the inserts in said recesses, the insert anchor portions tapered in directions extending toward the exterior of the recesses, and the outer layer engaging said tapered anchor portions to have taper corresponding to that of said insert anchor portions,

(h) said core consisting of consolidated ferrous powder metal steel having the following composition, with percentages being by weight:

iron	79 to 98%
copper	0 to 20%
carbon	0.4 to 1.0%
nickel	0 to 4.0%

(i) said outer layer consisting of a composite mixture of refractory particles in a binder metal.

4,597,457

ELECTRONIC SCALE WITH CRT DISPLAY

Minoru Ikekita, Kyoto, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Jun. 6, 1983, Ser. No. 501,250

Claims priority, application Japan, Aug. 19, 1982, 57-144378; Dec. 1, 1982, 57-211866; Dec. 8, 1982, 57-215159; Jan. 28, 1983, 58-13414

Int. Cl.[4] G01G *19/22, 23/32*

U.S. Cl. 177—25 **4 Claims**

1. An electronic scale comprising:

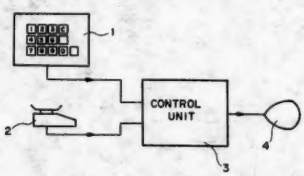
(a) input means including a manual data input device for entering nput data including at least unit prices of articles;

(b) weighing means for measuring the weights of the articles;

(c) control means for effecting an arithmetic operation in response to the unit price entered from said input means and the weight measured by said weighing means to calculate a price of each respective article;

(d) totalling means for totalling said prices, the prices and the number of articles for sale in a given weight range, and the prices and the number of articles for sale in a given price range;

(e) calculating means for calculating respective ratios of the sales amounts of the articles according to the article names;



(f) memory means for storing the sum of said total prices, said prices and said number of articles for sale in a given weight range, said prices and said number of articles for sale in a given price range, and said ratios of the sales amount of the articles according to said article names; and

(g) display means for displaying said input data from said input means, the result of the arithmetic operation by said control means, said sum of said total prices, said prices and said number of articles for sale in a given weight range, said prices and said number of articles for sale in a given price range, and said ratio of the sales amount of the articles according to the article names stored in said memory means under the control of said control means.

4,597,458

ELECTRIC BALANCE WITH ADJUSTABLE RELATIVE PRECISION

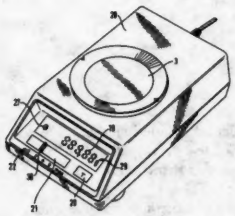
Erich Knothe, Bovenden; Franz-Josef Melcher, Hardegsen, and Christian Oldendorf, Göttingen, all of Fed. Rep. of Germany, assignors to Sartorius GmbH, Göttingen, Fed. Rep. of Germany

Filed Oct. 22, 1984, Ser. No. 663,568

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1983, 3340421

Int. Cl.⁴ G01G *23/14, 9/00, 7/00, 21/08*

U.S. Cl. 177—164 **9 Claims**



1. Electric balance having a measured value receiver, a digital signal processing unit and a digital display for displaying the weighing results, characterized in that setting means **(21, 24, 25)** are provided with which the relative precision, wherein the weight of an article being weighed controls the precision with which the weighing result is to be determined, can be set by the user.

4,597,459

WEIGHT DETECTING TYPE SENSOR

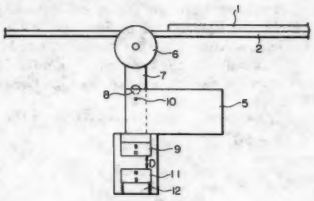
Yoshiki Iwata, Yokohama; Nobuo Kawase, Sagamihara; Yoshinori Tanaka, Sekiyado; Takashi Miyake, Kurume, and Hiroshi Kawaura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 28, 1984, Ser. No. 675,754

Claims priority, application Japan, Nov. 30, 1983, 58-226231

Int. Cl.⁴ G01G *3/14, 7/00*

U.S. Cl. 177—210 R **1 Claim**



1. A weight detecting type sensor for detecting a body conveyed on a body conveying belt, said sensor comprising:

a rotatable member mounted so that at least a portion thereof can project upwardly above the surface of the body conveying belt;

a strut mounting said rotatable member as aforesaid and having an aperture therethrough at a portion thereof;

a sensor having an optical axis associated with said aperture formed in said strut;

biasing means including a pair of magnets disposed below the bottom of said strut, for imparting an upwardly directed biasing force to said strut; and

means for adjusting the distance between said pair of magnets.

4,597,460

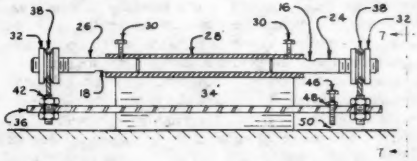
MULTIPLE LOAD CELL WEIGHING STRUCTURE

T. August Wernimont, 2801 Cathmar Ave., Burlington, Iowa 52601

Filed Feb. 19, 1985, Ser. No. 703,204

Int. Cl.⁴ G01G *9/00, 19/52, 1/34, 3/14*

U.S. Cl. 177—211 **2 Claims**



1. A weight detecting sensor assembly comprising:

(a) A support member suitable for holding four (4) load support beams in an essentially horizontal position. The support member is capable of providing lateral adjustments of the load support beams where

(b) each load support beam has a strain gage attached to sense the bending load it is supporting with

(c) a movable collar positioned on the end of each load support beam that is longitudinally adjustable so that the bending moment at the strain gage location can be varied,

(d) a locking means to secure the movable collars in position on the load support beam, the movable collars having

(e) a support cable formed into a loop that can be flexibly attached to the movable collars on the load support beam with the support cable possessing

(f) an anchor assembly that secures the ends of the cable together and attaches the support cable to the weighing platform, the weight detecting sensor assembly further comprising

(g) an adjustable overload stop that prevents overload damages to the support structure, support beams, collars, cables, and anchors.

4,597,461

VEHICLE HAVING PRE-ASSEMBLED CONSTRUCTIONAL UNIT FOR THE COCKPIT REGION THEREOF

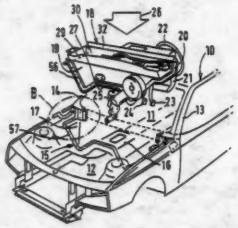
Fritz Köchy, Mainz; Klaus Brandel, Worrstadt; Horst Hullmann, Florsheim; Bernhard Neumann, Russelsheim, and Gerhard Helmsing, Eppstein, all of Fed. Rep. of Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 18, 1984, Ser. No. 601,446

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1983, 3315646

Int. Cl.[4] B60K *26/00, 37/00;* **B62D** *25/14, 65/00*

U.S. Cl. 180—90 **6 Claims**



1. In an automotive vehicle having a vehicle body shell including a pair of horizontally spaced generally vertically extending side pillars for receiving a windshield and body side and bottom structure which defines a passenger compartment and an engine compartment, a preassembled module including a dashboard with various vehicle accessories mounted thereto and accessible from the passenger compartment which is connected as a unit to the vehicle body structure, the improvement being that said module includes a base extending transversely of the vehicle body shell and which forms a fire wall for the vehicle to separate the engine compartment from the passenger compartment and having a first side to which the dashboard and dashboard mounted accessories are preassembled and a second side facing the engine compartment to which various engine compartment accessories are assembled, said module having first tapered connecting means which cooperably engage second tapered connecting means secured to said side body structure, upon the module being lowered through the windshield opening, to connect said module to said body shell and to automatically position said module relative to said body shell, means for securing said first and second connecting means together and sealing means for sealing the base of the module along its lower and side periphery to said body shell.

4,597,462

STEERING SYSTEM FOR VEHICLES

Shoichi Sano, Tokyo, and Yoshimi Furukawa, Tochigi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 29, 1985, Ser. No. 695,955

Claims priority, application Japan, Feb. 2, 1984, 59-18137

Int. Cl.[4] B62D *5/06*

U.S. Cl. 180—140 **3 Claims**

1. A steering system for a vehicle having a steerable front wheel and a steerable rear wheel, comprising:

a front wheel steering mechanism for steering said front wheel;

a rear wheel steering mechanism for steering said rear wheel in accordance with a travelling state quantity substantially influenced by a disturbance; and

said rear wheel steering mechanism including:

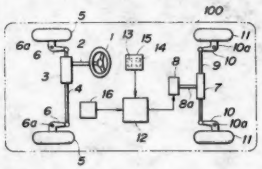
actuating means for actuating said rear wheels;

first detection means for detecting said travelling state quantity;

second detection means for detecting a vehicle's speed of said vehicle;

control means connecting to said first and second detection means and adapted to provide a control signal for said actuating means;

said control means having an operation process means for determining a provisional steering quantity of said rear



wheel depending on an output signal of said first detection means through a predetermined expression of function, a correction factor corresponding to said vehicle speed from an output signal of said second detection means, and a final steering quantity of said rear wheel based on said predetermined expression of function and said correction factor, and for producing said control signal representing said final steering quantity; and

said correction factor decreases as said vehicle speed decreases.

4,597,463

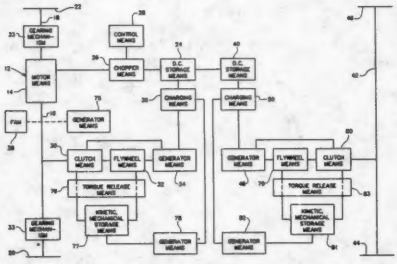
ELECTRIC VEHICLE USING THE VEHICLE'S KINETIC AND MECHANICAL POWER TO REGENERATE IT'S ENERGY STORAGE DEVICE

Richard Barnard, 2330 Olive Ave., Fremont, Calif. 94538

Filed Jan. 23, 1984, Ser. No. 573,034

Int. Cl.[4] B60K *9/00, 13/02;* **G05G** *1/00*

U.S. Cl. 180—165 **15 Claims**



1. and electrocombustible drive vehicle comprising

a. motor means for driving the electrocombustible vehicle said motor means being activated by combustible fuel or a pulsating voltage;

b. first means for storing electrical energy for use as DC voltage;

c. chopper means for providing a pulsating voltage to said motor means for activation of electro portion of said motor means, said first means for storing electrical energy proving DC voltage input to said chopper means;

d. means for controlling the quantity of said pulsating voltage supplied to said motor means;

e. first generator means for producing electrical voltage, said first generator means mechanical input being connected to

the direct output of said motor means independent of the movement of said vehicle allowing said generator to produce a voltage while the vehicle is in the idle position;

f. means for charging said first means for storing electrical voltage produced by said generator;

g. second means for storing electrical energy for use as a DC voltage;

h. second generator means for producing electrical voltage, said second generator means mechanical input being connected to a velocity dependent moving portion of electric vehicle independent of said output of said motor means and dependent on air movement relative to the vehicle, means for selectively charging said first and second means for storing electrical voltage employing said electrical voltage produced by said second generator means;

i. means for charging said second means for storing electrical energy employing said electrical voltage produced by said chopper means;

j. third generator means for producing electrical voltage, said third generator means mechanical input being connected to a velocity dependent moving portion of electric vehicle independent of said output of said motor means and dependent on the movement of the rear axle, means for selectively charging said first and second means for storing electrical voltage employing said electrical voltage produced by said third generator means thus, connection to the rear axle allows said third generator means to produce a voltage while the vehicle has a velocity;

k. first and second kinetic, mechanical storage means for storing kinetic, mechanical power produced by the mechanical output of said motor means, and the kinetic, mechanical output of velocity dependent parts of the vehicle, means for selecting connection to said mechanical and velocity outputs, means to release stored power at selected times;

l. fourth generator means for producing electrical voltage, said fourth generator means mechanical input being connected to said first kinetic, mechanical storage means independent of said output of said motor means and dependent on the movement of said first kinetic, mechanical storage means, means for selectively charging said first and second means for storing electrical voltage employing said electrical voltage produced by said fourth generator means thus, operation of said fourth generator means will allow energy to be produced while the vehicle is stopped, stored, and the vehicle's motor means is deactivated;

m. fifth generator means for producing electrical voltage, said fifth generator means mechanical input being connected to said second kinetic, mechanical storage means independent of said output of said motor means and dependent on the movement of said second kinetic, mechanical storage means, means for selectively charging said first and second means for storing electrical voltage employing said electrical voltage produced by said fifth generator means thus, operation of said fifth generator means will allow energy to be produced while the vehicle is stopped, stored, and the vehicles said motor means is deactivated;

n. first flywheel means for storing kinetic, mechanical power and first clutch means for disconnecting and connecting said flywheel means to the front axle at a selected range of velocities;

o. second flywheel means for storing kinetic, mechanical power and second clutch means for disconnecting and connecting said flywheel means to the rear axle at selected range of velocities;

p. first and second torque release means that allows connect or disconnect of said first and second kinetic, mechanical storage means from said output of said motor means and said velocity dependent parts of the vehicle when full charge of power has been retained;

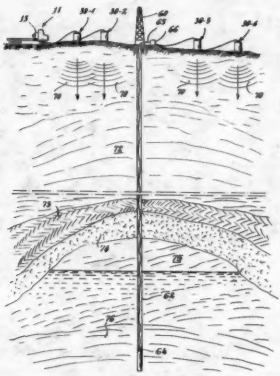
q. kinetic energy shown as $KE=\frac{1}{2}MV^2$ and the resulting H.P. us used to operate said generation equipment at any velocity.

4,597,464

METHOD AND SYSTEM FOR WELL VELOCITY SHOOTING AND VERTICAL SEISMIC PROFILING

Paul Chelminski, Norwalk, Conn., assignor to Bolt Technology Corporation, Norwalk, Conn.

Filed May 25, 1982, Ser. No. 381,698
Int. Cl.[4] G01V *1/09*
U.S. Cl. 181—114 **4 Claims**



3. A method of well velocity shooting and vertical seismic profiling comprising the steps of:

transporting on a single vehicle to a well site a plurality of at least two nested pairs of containers, each container having a displaceable diaphragm on the bottom thereof,

separating said nested pairs of containers and arranging at least four of said separated containers from said nested pairs in a desired array near the well site with their respective displaceable diphragms being placed in impulse-transmitting relationship with the ground near said well,

filling each of said separated containers with liquid at the well site,

selecting at least one seismic source parameter to be different among the various containers,

said seismic source parameter being selected from the group of parameters comprising: mass of water in the respective container, firing volume of the airguns in the respective containers, pressure of the pressurized gas being discharged from the airguns into the liquid in the respective containers, and amount of density-increasing material added to the liquid in the respective containers,

mounting an airgun which may abruptly release pressurized gas in the liquid in each of said separated containers, and

firing said airguns in a predetermined manner thereby abruptly releasing pressurized gas into the liquid in said containers for providing powerful seismic impulses which are transmitted into the ground near the well by the displaceable diaphragms of said containers.

4,597,465

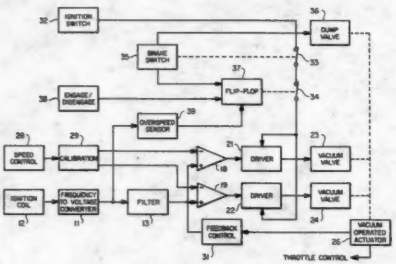
CRUISE CONTROL SYSTEM AND METHOD WITH OVERSPEED SENSOR

Charles F. Burney, Orland, Calif., assignor to A.R.A. Manufacturing Company, Grand Prairie, Tex.

Filed Oct. 27, 1982, Ser. No. 437,032
Int. Cl.[4] F02D *11/10*
U.S. Cl. 180—176 **12 Claims**

1. In a system connected to the throttle of an engine for maintaining a vehicle at a predetermined speed, said engine having an ignition coil: means for providing a signal corresponding to the actual speed of the vehicle, means for providing a reference signal corresponding to the desired speed of the

vehicle, means responsive to said signals for providing a speed correction signal in the event that the actual speed differs from the desired speed, actuator means responsive to the speed control signal for adjusting the throttle to maintain the vehicle at the desired speed, means connected to the ignition coil for providing an engine speed signal, first and second circuit means responsive to the engine speed signal for providing output signals which change at increasingly different rates



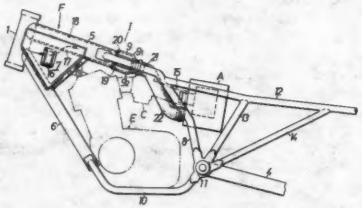
with increasing rates of change in the engine speed, said first and second circuit means including capacitors which charge at different rates in response to changes in the engine speed signal, means responsive to the output signals for providing an overspeed signal in the event that the engine speed changes at a rate greater than a predetermined rate, and means responsive to the overspeed signal for releasing the throttle from control by the actuator means in the event of a sudden increase in the speed of the engine.

4,597,466

AIR INTAKE APPARATUS FOR VEHICLE

Kozo Yamada, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 23, 1985, Ser. No. 737,654
Claims priority, application Japan, May 28, 1984, 59-107946
Int. Cl.[4] B62J *17/06*
U.S. Cl. 180—225 **5 Claims**



1. In a vehicle in which an engine is mounted on a body frame having at least a head pipe, a main pipe extending rearwardly of said head pipe and twin center pipes respectively extending on right and left sides of said head pipe rearwardly from a forked junction at a rear end of said main pipe, between which center pipes an air cleaner connected to an intake pipe of said engine is disposed rearwardly of said engine,

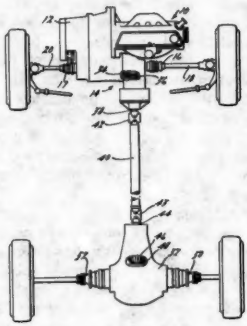
an air intake apparatus comprising: an air intake passage defined by the inside of said main pipe; and an air chamber defined by the inside of a gusset for reinforcing the connection between said main pipe and said pair of center pipes, said air chamber having an inlet in communication with said air intake passage and an outlet in communication with said air cleaner.

4,597,467

FOUR-WHEEL DRIVE CLUTCH MECHANISM

Thomas R. Stockton, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 18, 1983, Ser. No. 553,338
Int. Cl.[4] B60K *17/34*
U.S. Cl. 180—248 **1 Claim**



1. An axle drive mechanism comprising:

a rotatable outer race having multiple sets of ramp surfaces;

first and second inner races located within the outer race coaxially mounted for independent rotation;

first and second sets of rollers mounted for rotation on the inner races and for movement in either circumferential direction relative to the ramp surfaces of the outer race between a released position where the rollers are out of contact with the ramp surfaces and a drive position where the rollers are wedges between a set of ramp surfaces and the surface of the inner race;

cage means in which the first and second sets of rollers are retained, rotatable relative to the inner and outer races, for moving the rollers circumferentially relative to the inner and outer races;

a nonrotating member;

drag means slidably connecting the cage means to the nonrotating member for urging the rollers to a drive position due to frictional contact between the cage means and the nonrotating member;

means for selectively connecting and disconnecting the drag means and the nonrotating member;

means for biasing the rollers to the released position;

a ground connector mounted for rotation about the axes of the inner and outer races relative to the cage means and the inner and outer races, wherein the cage means is resiliently biased into sliding frictional contact with the ground connector, and wherein the connecting and disconnecting means connects the ground connector to the nonrotating member and disconnects the ground connector from the nonrotating member;

a source of electrical power;

an electrical solenoid mounted on the casing having a pin biased into engagement with the ground connector adapted to retract the pin from said engagement when the solenoid is energized;

switch means for connecting and disconnecting the power source and the solenoid, wherein the switch means includes a gear selector controlled by the vehicle operator having forward drive and reverse drive positions adapted to connect the power source to the solenoid whenever the gear selector is moved between the forward drive and reverse drive positions and to disconnect the power source from the solenoid whenever the gear selector is located in a forward drive position or a reverse drive position.

4,597,468

COMPACT INDUSTRIAL VEHICLE

Karl Friedrich, Sipplingen, Fed. Rep. of Germany, assignor to Kramer-Werke GmbH, Ueberlingen, Fed. Rep. of Germany

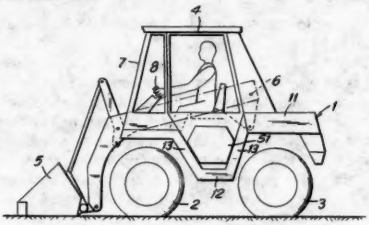
PCT No. PCT/EP83/00323, § 371 Date Aug. 2, 1984, § 102(e) Date Aug. 2, 1984, PCT Pub. No. WO84/02316, PCT Pub. Date Jun. 21, 1984

PCT Filed Dec. 1, 1983, Ser. No. 638,462

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1982, 3245085

Int. Cl.[4] B60K *17/30*

U.S. Cl. 180—255 13 Claims



1. A compact industrial vehicle comprising a frame (1) extending in the normal forward travel direction, wheel support legs (16) each having a lengthways axis mounted on said frame, four steerable and powerable wheels (2, 3) suspended from said frame (1) by said wheel support legs (16), each said wheel having a wheel rim with said wheel support extending upwardly from said wheel rim to said frame, relative to the forward travel direction of said wheels (2, 3) said wheels are displaceable from the forward travel direction into a lateral direction, wherein the improvement comprises:

(a) frame (1) is formed as a multi-level construction including frame segments (11) located above said wheels and second frame segments located vertically below said first frame segments and arranged between the wheels in the normal forward direction and third frame segments (13) extending upwardly and obliquely of the vertical between said first and second frame segments;

(b) said wheel support legs include horizontal axles (15) located at the upper part of said wheels with said wheel supports extending downwardly from said axles (15) to said wheels (2, 3);

(c) in the vertical direction said axles (15) are positioned between the lower side of said first frame segments (11) and the center of said wheels (2, 3);

(d) a motor (51) for driving said wheels is located on the upper side of said second frame segments; and

(e) said frame having a front end and a rear end spaced apart in the normal travel direction and a pair of sides extending in the normal travel direction between the front and rear ends, an operator station located on said frame in the region of and above said second frame segments with an entrance to said operator's station on one said side of said frame, and a boom for mounting a working attachment articulated to said frame behind said operator station in the normal travel direction and pivoted to said frame on the opposite side thereof from the entrance to the operator station.

4,597,469

COLLAPSIBLE HEADPHONE STRUCTURE

Mitsukatsu Nagashima, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 21, 1985, Ser. No. 714,487

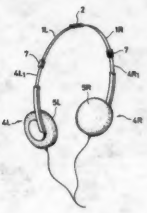
Claims priority, application Japan, Mar. 22, 1984, 59-41111[U]

Int. Cl.[4] H04R *25/00*

U.S. Cl. 181—129 4 Claims

1. A collapsible headphone structure comprising:

a pair of headband arms, each being comprised of an upper and a lower arm section; a pair of earphone units each respectively affixed to one end of said lower arm section; a first joint member for pivotally connecting said pair of headband arms; a pair of second joint members for pivotally connecting said upper sections of said headband arms



to said lower sections of said headband arms; whereby said handband arms are foldable by means of said first and second joint members, wherein the rotational plane of said arms in said first joint is perpendicular to the rotational plane of said sections in said second joint members.

4,597,470

CAR SPEAKER SYSTEM

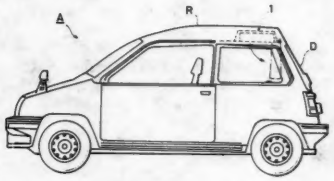
Kazunori Takagi, Saitama; Hiroshi Soma, Tokyo; Yoshiaki Miyata; Yasuki Motozawa, both of Saitama, and Hitoshi Katou, Tokyo, all of Japan, assignors to Pioneer Electronic Corporation and Honda Giken Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Apr. 22, 1985, Ser. No. 725,859

Claims priority, application Japan, Apr. 22, 1984, 59-80923

Int. Cl.[4] G10K *5/04*

U.S. Cl. 181—141 11 Claims



1. A car speaker system for vehicular use for a vehicle having a door at its rear end, comprising a plurality of speaker units; a cabinet containing said plurality of speaker units therein, one end of said cabinet being rotatably mounted to a rear portion of a ceiling panel of said vehicle such that said cabinet can be swung between a first, upper position where a speaker mounting surface of said cabinet is substantially parallel with said ceiling panel and wherein said speaker units are pointed generally toward the interior of said vehicle, and a second, lower position where said speaker mounting surface is in a substantially upright position with said cabinet being in a substantially pendant position, and wherein said speaker units are pointed generally toward the rear exterior of said vehicle; and locking means for locking said cabinet in said first position.

4,597,471

HEAVY DUTY PUMP JACK

Carl E. Anderson, 12 St. Stephens Pl., Staten Island, N.Y. 10306

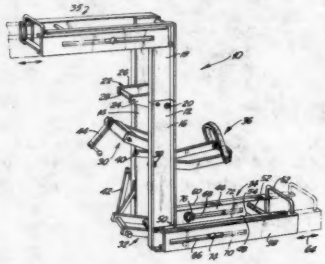
Filed Mar. 22, 1985, Ser. No. 714,932

Int. Cl.[4] E04G *1/20*

U.S. Cl. 182—136 20 Claims

17. A pump jack arrangement for traveling up and down a pole, comprising, a frame member, upper and lower shackle

members supported by said frame member, a pump arm pivotally coupled to said frame member for causing said shackle member to alternately grip the pole with the non-gripping shackle member being stepped upwardly along the pole, said upper shackle having rod means at its front end, handle means for cranking said rod means to ride the pump jack down the pole, and wherein said frame member comprises a pair of outwardly opened, laterally opposing frame U-shaped channels coupled together in spaced apart relationship for straddling the pole, a platform support extending from said frame member and comprising a first pair of outwardly opened,



laterally opposing U-shaped channels projecting respectively from the frame channels, spacer rods extending between said first pair of channels, a second pair of U-shaped channels inwardly opened and slidably received respectively within said first pair of channels, to permit slidable adjustment of the length of said platform support, opposing elongated slots formed in at least one of said first and second pairs of channels, adjustable clamping members passing through said elongated slots to lock first and second pairs of channels at the desired length, and a handle bar interconnecting the distal ends of said second pair of channels to adjust the extended length of said platform support.

4,597,472

SCAFFOLDING SYSTEM

Bo A. Hjelm, Älgvägen 35, S-302 70 Halmstad, Sweden

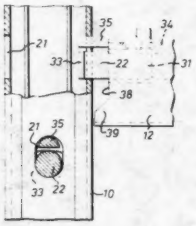
PCT No. PCT/SE83/00154, § 371 Date Dec. 9, 1983, § 102(e) Date Dec. 9, 1983, PCT Pub. No. WO83/03868, PCT Pub. Date Nov. 10, 1983

PCT Filed Apr. 22, 1983, Ser. No. 567,866

Claims priority, application Sweden, Apr. 22, 1982, 82025180

Int. Cl.[4] E04G *1/06*

U.S. Cl. 182—178 **7 Claims**



4. A scaffolding system comprising spaced tubular uprights, jointing pieces insertable in said uprights, braces insertable in said uprights, connecting beams and ties extending between said uprights, and fastening means for interconnecting said uprights and said connecting beams, characterized in that the uprights are in the form of tubes with holes in the wall thereof, said fastening means comprising locking hooks insertable in said openings, and inwardly projecting stiffening and guide flanges extending over the entire length of the uprights and adapted to guide said jointing pieces and said braces inserted in the tubes, while maintaining a spacing between the tube wall and any jointing pieces and braces inserted in the tube which is sufficient for accommodating that part of the locking hook which projects into the tube, said fastening means for interconnecting uprights and connecting beams being in the form of bayonet joints and each comprising one of the holes in the upright, the locking hook being secured to the end of the connecting beam and rotatable together therewith, and a catch which is displaceably mounted at the end of the connecting beam and is adapted, after the connecting beam and the upright have been interconnected, to be moved into locking engagement with said upright to prevent rotation of the connecting beam relative to the upright, said holes of the bayonet joints in the upright being non-circular, said holes of the upright comprising a hole portion for receiving the catch, said connecting beam having a portion, at least at one end, which is so formed that the locking hook can be moved further into the hole in the upright than is necessary for bayonet engagement when the bayonet joint is closed, said connecting beam having a supporting portion which is adapted to rest against the upright in order to maintain said engagement after the connecting beam and the locking hook have been rotated into engagement.

4,597,473

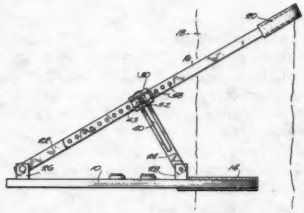
TREE STAND

Paul L. Peck, Fond du Lac, Wis., assignor to Archery Designs, Inc., North Fond du Lac, Wis.

Filed Aug. 19, 1985, Ser. No. 766,799

Int. Cl.[4] A01M *31/02*; A45F *3/26*; A47C *9/10*

U.S. Cl. 182—187 **10 Claims**



1. A tree stand comprising,

a platform,

a notch in the rear of said platform adapted to receive a tree trunk,

a flexible metal band adapted to embrace the tree trunk,

support means on each side of said platform for adjustably engaging said band, each said support means including front and rear legs pivotally connected to said platform and slideably connected to each other for movement between a first position in which said legs lie against said platform and a second position in which they fix said band at an angle relative to said platform so the band engages the back of a tree above said platform,

means to automatically lock said legs in said second position as said legs are raised from said first position,

a guide fixed in one of said legs,

said band having a plurality of holes spaced therealong and being received in said guide,

a plunger reciprocally mounted on said guide for movement between a lock position engaging a hole in said band and a retracted position in which said plunger is withdrawn from said band,

a cam acting actuator pivotally connected to said plunger and moveable between positions in which said plunger is in said lock position or said retracted position,

and means to selectively fix said actuator relative to said plunger.

4,597,474

BRAKE FOR A BICYCLE

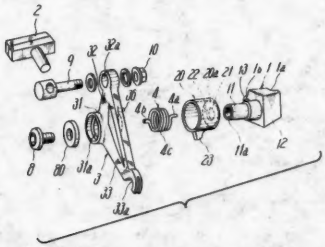
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jul. 29, 1983, Ser. No. 518,420

Claims priority, application Japan, Aug. 11, 1982, 57-122399[U]; Oct. 9, 1982, 57-153420[U]

Int. Cl.[4] B62L 3/00

U.S. Cl. 188—24.21 4 Claims



1. A brake for a bicycle, comprising a pair of mounting bases each comprising a base member having an end face with a shaft projecting from said end face, a pair of cantilevers each having a boss and lever portions and supported rotatably to a said shaft at one of said mounting bases respectively, a pair of brake shoes fixed to said lever portions at said cantilevers respectively, a pair of return springs interposed between said mounting bases and said cantilevers respectively, a pair of cylindrical members covering said springs, said cylindrical members forming spring chambers housing said springs, each said return spring comprising a coil spring having at each end an extension extending axially with respect to said coil spring, each said cylindrical member having (i) a through bore receiving a said shaft of a corresponding one of said mounting bases and (ii) a bottom face which contacts a said end face of said corresponding one of said mounting bases, each said cylindrical member having a retaining bore at said bottom face for receiving one said extension of said coil spring and each mounting base having a retaining bore at said end face for receiving said one extension of said coil spring, said one extension of said coil spring passing through a said retaining bore of a said cylindrical member and being received in a said retaining bore of a corresponding said mounting base to thereby fix each cylindrical member to a corresponding said mounting base, the other said extension of each said coil spring being fixed to rotate with a respective said cantilever, and said brake further comprising rotation restricting means for restricting rotation of said cantilevers relative to said cylindrical members.

4,597,475

UNIVERSALLY MOVABLE SUSPENSION MEMBER

Martin Lässig, Kiel, and Ulf Bey, Grossharrie, both of Fed. Rep. of Germany, assignors to Anschütz & Co. GmbH, Eil, Fed. Rep. of Germany

PCT No. PCT/DE82/00231, § 371 Date Jul. 21, 1983, § 102(e) Date Jul. 21, 1983, PCT Pub. No. WO83/02155, PCT Pub. Date Jun. 23, 1983

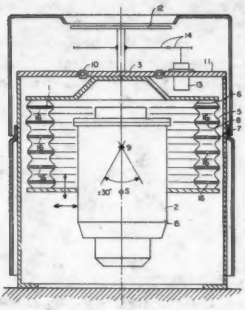
PCT Filed Dec. 11, 1982, Ser. No. 525,051

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1981, 3149326

Int. Cl.[4] F16F 9/10

U.S. Cl. 188—378 7 Claims

1. A universally movable suspension member for direction-indicating display systems, especially for a gyro system (2), in which the suspension member is disposed between a revolving disk (3) and the gyro system (2) to suspend the gyro system from the disk for pendulum type motion about a pivot point (9) spaced beneath said disk, and wherein the suspension member has the form of a concentric double-bellows unit (1) having a flexible bellows section (7) comprising a plurality of axially spaced pairs of registering, oppositely directed folds (5,6), wherein the space defined between said pairs of oppositely directed folds is filled with a damping liquid, and wherein a



supporting ring (8) is dipsosed in the space between each pair of said registering folds.

4,597,476

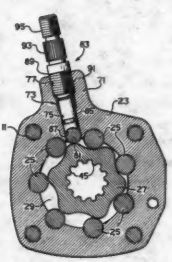
HYDRAULIC GEROTOR MOTOR AND PARKING BRAKE FOR USE THEREIN

Wayne B. Wenker, Hopkins, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 481,972, Apr. 4, 1983, abandoned. This application Apr. 25, 1985, Ser. No. 726,942

Int. Cl.[4] F16D 55/12; F16H 57/10; B60K 41/26

U.S. Cl. 192—3 R 25 Claims



1. A rotary fluid pressure device of the type including housing means defining fluid inlet means and fluid outlet means; an internal gear set associated with said housing means and including an internally-toothed member and an externally-toothed member eccentrically disposed within said internally-toothed member, one of said members having rotational movement about its axis, and one of said members having orbital movement about the axis of the other member, the teeth of said members interengaging to define expanding and contracting volume chambers during said movements; valve means operable in response to one of said movements to communicate fluid from said fluid inlet means to one of said expanding and contracting fluid chambers, and from the other of said fluid chambers to said fluid outlet means; input-output shaft means, and means operable to transmit torque between said input-output shaft means and one of said toothed members, characterized by:

(a) a lock member operably associated with said internally-toothed member and disposed at least partially within one of said volume chambers;

(b) actuation means operably associated with said lock member and operable to move said lock member between a first position in which said lock member is disposed to

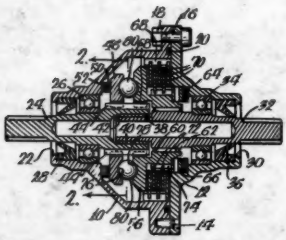
permit normal orbital and rotational movement of said toothed members, and a second position in which said lock member extends a sufficient distance into said volume chamber to engage one of the external teeth of said externally-toothed member as said volume chamber approaches minimum chamber volume, to prevent further orbital movement of said member having orbital movement, thereby preventing rotation of said member having rotational movement.

4,597,477

BIDIRECTIONAL BRAKE

Kent Miller, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Apr. 16, 1984, Ser. No. 601,039
Int. Cl.[4] F16D 67/02
U.S. Cl. 192—8 R 2 Claims



1. A bi-directional brake for use in a drive train to permit a rotary driving element to drive a rotary driven element but not vice versa comprising:

a rotary input shaft including a recess at one end;

a rotary output shaft coaxial with said input shaft and having an end journalled in said recess;

first axially extending splines associated with said input shaft;

second axially extending splines associated with said output shaft;

first and second, axially spaced, cam elements slidably received on said first splines and including ball ramp cam means at their interface;

means coupling said second cam element to said rotary output shaft;

a first fixed brake element in proximity to said first cam element oppositely of said second cam element;

a first rotary brake element carried by said first cam element oppositely of said second cam element defining an interface and engageable with said first fixed brake element for providing a drag on said input shaft via said first cam element and said first spline;

a brake pack associated with said second cam element including a plurality of second rotary brake elements; slidably received on said second splines and interleaved with a plurality of second fixed brake elements, said brake pack adapted to be compressed by axial movement of said second cam element;

said first spline and said first and second cam elements defining a limited lost motion connection between said shafts; and

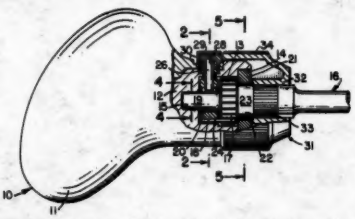
means for biasing said second cam element toward said first cam element, and thus said first brake elements into engagement with each other.

4,597,478

RATCHETING TOOL WITH IMPROVED SUPPORT FOR DRIVEN SHANK

Michael L. Bodnar, Gastonia, N.C., assignor to Easco Corporation, Baltimore, Md.

Filed Jul. 10, 1984, Ser. No. 629,503
Int. Cl.[4] B25B 13/46; F16D 11/06
U.S. Cl. 192—43.1 1 Claim



1. A ratcheting tool comprising a handle, a ratchet housing fixed to the handle, the ratchet housing having a blind axial bore and further having a communicating counterbore formed therein, a driven shank having an enlarged-diameter portion formed with a ratchet, a pivotable cam shifter trapped in the bottom of the blind axial bore rearwardly of the ratchet, a pin carried by the cam shifter and extending radially thereof, the ratchet housing having an arcuate slot through which the pin extends, a selector button mounted on the pin, the selector button having a closed radial bore formed therein for receiving the pin carried by the cam shifter, a spinner carried by the driven shank and rotatably surrounding the ratchet housing forwardly of the selector button, the selector button and the spinner having respective radial extents which are substantially coterminous with each other, respective pawls carried by the cam shifter and extending forwardly therefrom to engage the ratchet, a collar press-fitted within the counterbore forwardly of the ratchet, thereby retaining the driven shank in the ratchet housing, the collar having an inner annular bearing surface, the ratchet housing further having a reduced-diameter closed cylindrical recess formed therein rearwardly of the blind axial bore and communicating therewith, the cam shifter having a central recess formed therein, the driven shank having a reduced-diameter rearwardly-extending cylindrical portion passing through the central recess in the cam shifter and rotatably journaled in the closed cylindrical recess in the ratchet housing, and the driven shank having an intermediate portion forwardly of the ratchet and journaled within the inner annular bearing surface of the collar, whereby the driven shank is rotatably supported fore and aft in the ratchet housing.

4,597,479

CLUTCH AND BRAKE UNIT

Seiichi Kitano, Shijyonawate, and Yukio Ono, Katano, both of Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Japan

Division of Ser. No. 335,330, Dec. 29, 1981, Pat. No. 4,515,256.
This application Mar. 4, 1985, Ser. No. 707,637
Claims priority, application Japan, Jan. 20, 1981, 56-7113[U]
Int. Cl.[4] F16D 67/02
U.S. Cl. 192—18 R 3 Claims

1. A clutch and brake device comprising:

a clutch housing having an annular fixed wall;

an output shaft aligned with said housing;

an input shaft;

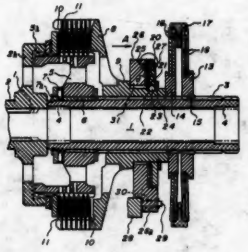
a clutch hub rotationally connected to said input shaft;

a clutch case spline mounted on said output shaft and axially movable therealong between a first position engaging said clutch hub for driving said output shaft with said input shaft and a second position disengaging said clutch hub and discontinuing said drive of said output shaft with said input shaft, said case having a periphery and a shoulder

provided around said periphery facing said annular fixed wall;

spring means urging said clutch case towards said first engaging position;

means for moving said clutch case from said first engaging position to said second disengaging position against the urging of said spring means, and



an annular friction plate attached to said periphery of said clutch case so as to be moved rotationally and axially therewith and facing said fixed wall, said friction plate having a frictional surface extending radially of said output shaft;

whereby, when said means for moving said clutch case is operated to move said case from said first engaging position to said second disengaging position, said frictional surface contracts said fixed wall to brake said output shaft.

4,597,480

POSITIVE ENGAGEMENT TORQUE SENSOR

Robert A. Schwarz, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 24, 1984, Ser. No. 685,471

Int. Cl.[4] F16D *1/10*

U.S. Cl. 192—54 **22 Claims**

1. A positive engagement torque sensor having a pair of members rotatable independently of each other, means operable upon the occurrence of relative rotation between said members for locking said members together for rotation in unison to transmit torque in either forward or reverse directions of rotation with minimal free play, and signalling means for indicating said relative rotation including a movable falt carried by one of said members, means for moving said flag to a signalling position upon said occurrence of relative rotation, and noncontactable sensor for detecting the flag in said signalling position.

4,597,481

HYDRODYNAMIC CONTROL COUPLING

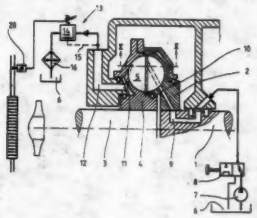
Helmut Müller, and Klaus Brosius, both of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Mar. 18, 1983, Ser. No. 476,846

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1982, 3211337

Int. Cl.[4] F16D *33/16, 33/18*

U.S. Cl. 192—58 A **13 Claims**



1. A hydrodynamic control coupling comprising a drive annular vane wheel and a driven annular vane wheel having a common axis, a respective shaft supporting each of the vane wheels for rotation around the common axis; the vane wheels cooperating for defining a toroidal working chamber between them;

each vane wheel carrying respective vanes in the working chamber which extend toward the vanes of the other vane wheel for enabling the driven vane wheel to be driven by receiving torque from the drive vane wheel through the flow of a working fluid in a flow direction within the working chamber; the vanes of the vane wheels all being in respective planes which include respective radii from said axis, and being inclined at an angle with respect to the axis of the coupling for intensifying flow of working fluid in the working chamber;

a sump for working fluid;

an inlet to the working chamber for working fluid from said sump to be delivered to the working chamber;

an outlet from the working chamber for outflow of working fluid from the working chamber to said sump, the working chamber outlet comprising a plurality of tangentially oriented bores formed in the driven vane wheel and extending in the flow direction inwardly toward the axis for acting with the inclined vanes to provide a pressure in the working chamber outlet which indicates the torque being received from the drive vane wheel; and

a valve to which the outlet is connected for determining the filling level of the working chamber, the valve operating in response to pressure in the working chamber oulet to control the rate at which working fluid leaves the working chamber, thereby controlling the torque being received.

4,597,482

CONTROL DEVICE FOR A DIRECT-COUPLING HYDRAULIC CLUTCH IN A HYDRAULIC TORQUE CONVERTER

Yoshimi Sakurai, Tamashi; Takashi Aoki, Fujimi, and Masao Nishikawa, Tokyo, all of Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Sep. 26, 1984, Ser. No. 655,026

Claims priority, application Japan, Sep. 28, 1983, 58-149836[U]

Int. Cl.[4] F16D *21/04*

U.S. Cl. 192—0.052 **2 Claims**

1. A control device for controlling the operation of a direct-coupling hydraulic clutch of a hydraulic torque converter for use in an automotive vehicle, said hydraulic torque converter having an input member and an output member and being

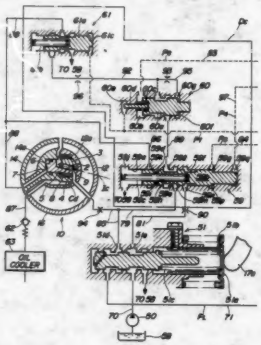
coupled to a transmission of said automotive vehicle selectable at a plurality of transmission gear ratios, said direct-coupling hydraulic clutch being arranged between said input and output members of said hydraulic torque converter and operable to mechanically engage said input and output members with each other, said control device comprising:

an operating fluid pressure source for generating operating fluid pressure;

first fluid line means coupled between said operating fluid pressure source and said direct-coupling hydraulic clutch for supplying said clutch with fluid pressure derived from said operating fluid pressure source;

selector valve means disposed in the path of said first fluid line means and shiftable to a first or a second position thereof in response to a transmission gear ratio established by said transmission,

said selector valve means being adapted to open said first fluid line means to said direct-coupling hydraulic clutch



when said selector valve assumes said first or second position, and to close said first fluid line means when said selector valve assumes a third position thereof intervening between said first and second positions; and

a second fluid line branching off from said first fluid line means at a location between said selector valve means and said direct-coupling hydraulic clutch and communicating with a tank,

said selector valve means being arranged across said second fluid line;

said selector valve means having a valve operable to close said second fluid line when said first or second position is assumed,

said valve being operable to open said second fluid line to drain the same when said third position is assumed, to thereby cause escape of operating oil pressure to said tank, thereby disengaging said direct-coupling hydraulic clutch during the shifting of said transmission between said transmission gear ratios, thus mitigating gear-shifting shocks.

4,597,483

HYDROSTATIC CLUTCH

Louis-Claude Porel, Rambervillers, France, and Ivan Cyphelly, Bad Grund, Fed. Rep. of Germany, assignors to Hydro Rene Allee Rene Leduc Azerailles, Azgrailles, France and Glyco Antriebs Technick GmbH, Wiesbaden, Fed. Rep. of Germany

Filed Nov. 29, 1982, Ser. No. 445,027

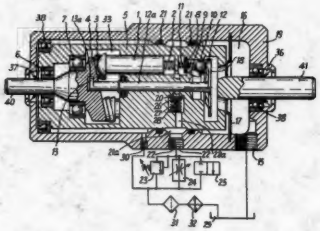
Claims priority, application France, Nov. 30, 1981, 81 22468

Int. Cl.[4] F16D *31/02*

U.S. Cl. 192—59 **16 Claims**

1. A hydrostatic clutch comprising:

a self-starting, reversible, hydrostatic pump including a casing, and having a driven shaft coupled to said casing for providing output rotational motion therefrom, a driving shaft for receiving input rotational motion, a cam coupled to receive rotational motion from said driving shaft, a plurality of pistons bearing on said cam and being pumped by the rotation thereof, flow rate regulation means, and a tank for containing hydraulic fluid, said hydraulic fluid being drawn from said tank and returned thereto via said flow rate regulation means, said flow rate regulation means regulating said flow rate from its maximum value for which the relative motion of said driving shaft with respect to said driven shaft is maximum, to a



zero value for which the relative motion of said driven shaft is zero, wherein;

said pump includes a suction side for receiving hydraulic fluid from said tank;

said clutch including rotative seals for preventing overflow of leakages to said suction side disposed between regions where said leakages appear and said suction side; and

a draining port, provided for returning directly said leakage fluid to said tank.

4,597,484

SYNCHRONIZER RING IN VEHICLE SPEED CHANGE GEAR

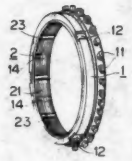
Hiroshi Takiguchi; Yoshikatu Sugiyama, both of Kanagawa, and Ryoji Hosoya, Yokosuka, all of Japan, assignors to Kyowa Works Co., Ltd., Kanagawa, Japan

Filed Mar. 26, 1984, Ser. No. 594,775

Claims priority, application Japan, Apr. 6, 1983, 58-60614

Int. Cl.[4] F16D *13/24, 13/66*

U.S. Cl. 192—70.15 **12 Claims**



1. A synchronizer ring in a vehicle speed change gear, comprising

a ring body having an axis, a circumference and a clutch surface; and

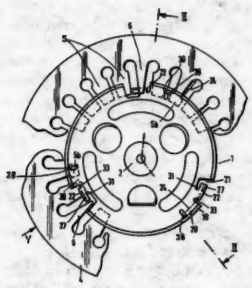
a resin formed layer disposed on said clutch surface of said ring body and having a circumferential groove extended in a direction of said circumference of said ring body and an axial groove extending in the direction of said axis of said ring body, said circumferential and axial grooves crossing each other, said circumferential groove having a pitch in the range of 0.5 to 2.0 mm, a topland width in the range of 2.0 to 1.5 mm, and said axial groove having a depth that does not reach said clutch surface of said ring body but instead ends before it reaches said clutch surface of said ring body.

4,597,485

FRICTION CLUTCH

Helmut Braun, Baden-Baden, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Aug. 6, 1984, Ser. No. 637,901
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1983, 3328359; Dec. 16, 1983, 3347817
Int. Cl.[4] F16D *13/50*; B25G *3/02*
U.S. Cl. 192—70.27 24 Claims



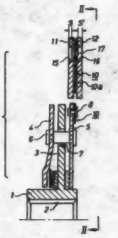
1. A friction clutch, particularly for use in motor vehicles, comprising a support including a housing; an axially movable pressure plate in said housing; a diaphragm spring disposed in said housing between said support and said plate and having a first portion reacting against said support, a second portion bearing against said plate, first prongs extending at least substantially radially inwardly from said portions and second prongs alternating with at least some of said first prongs, as considered in the circumferential direction of said spring, said first and second prongs being axially offset relative to each other and having radially innermost portions, the number of said first prongs exceeding the number of said second prongs; a substantially plate-like axially movable release member having a first side and a second side, a marginal portion provided with an opening for each of said second prongs, first substantially coplanar abutments provided at said first side and engaging the innermost portions of said first prongs, and second substantially coplanar abutments provided at said second side and each engaging the innermost portion of a discrete second prong, the distance between the axis of said spring and the first abutments at least approximating the distance between such axis and said second abutments, at least some of said abutments having convex surfaces in contact with the respective prongs, said release member being movable angularly relative to said spring to place said second prongs into register with the respective openings and being arranged to maintain said first and second prongs in axially stressed condition so that the axial distance between the planes of said first and second prongs when said prongs engage the respective abutments exceeds the axial distance between said planes when said second prongs register with and are free to enter the respective openings; and actuating means for moving said release member axially in a direction to pivot said spring in the region of one of said first and second portions and to thereby relax the bias of said spring upon said pressure plate, said first side of said release member facing in and said second side of said release member facing counter to said direction.

4,597,486

CLUTCH DISC ASSEMBLY WITH BALANCING MEANS

Yoshiaki Kabayama, Kadoma, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Aug. 9, 1984, Ser. No. 639,080
Claims priority, application Japan, Aug. 9, 1983, 58-124168[U]
Int. Cl.[4] F16D *13/68*
U.S. Cl. 192—107 R 5 Claims



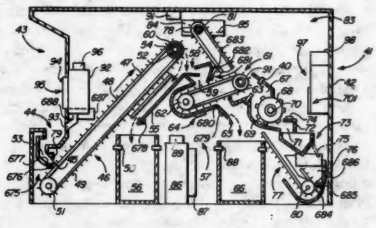
1. A clutch disc assembly comprising a disc adapted to be connected to an output shaft; a supporting plate means provided at the outer peripheral portion of the disc; a pair of friction facings fixed to corresponding surfaces of the plate means; each facing having a friction surface and at least one aperture, the apertures of both facings being in axial alignment with one another; and a rivet for correcting an unbalance of an inertial mass of the disc assembly around the output shaft and fixed to the radially outer portion of the plate means through the aperture and recessed from the friction surfaces of the friction facings.

4,597,487

METHOD AND APPARATUS FOR SELECTIVE SCRAP METAL COLLECTIONS

Kennith D. Crosby; William J. Tuten, both of Scottsdale; Harold W. Black, and Bertil R. Bergquist, both of Mesa, all of Ariz., assignors to Creative Technology, Inc., Scottsdale, Ariz.

Filed Jul. 28, 1983, Ser. No. 518,148
Int. Cl.[4] G07F *1/06*
U.S. Cl. 194—209 116 Claims



1. A can collection apparatus for collecting aluminum cans from an assortment of trash, including tin-plated steel cans, plastics, paper items, glass, and the like, and for compensating the depositor of the aluminum cans based on the weight of the aluminum cans so deposited, said can collection apparatus comprising:

start means responsive to actuation by a depositor for initiating the system and starting all conveyor motors;

input conveyor means for transporting said assortment of trash from a first input conveyor station to a second input conveyor station;

input hopper means for receiving the deposited assortment of trash placed therein by a depositor, and for depositing same onto the first input conveyor station of said input conveyor means;

magnetic separator means proximate said second input conveyor station for separating out ferrous metal, including tin-plated steel cans, from said assortment of trash and dropping said ferrous metal into a steel can receptacle;

separator means including a separator conveyor means for transporting a non-ferrous assortment of trash from a first separator conveyor station to a second separator conveyor station, said first separator conveyor station having a separator input;

said second input conveyor station discharging said non-ferrous assortment of trash into the input of said separator means;

heavys detection means operatively disposed within the input of said separator means, and including an impact platform means for determining the weight of each of the items of said assortment of trash as they fall from said second input conveyor station onto said impact platform means as a function of the displacement of said impact platform means, said heavys detection means discharging all of said non-ferrous assortment of trash into the first separation conveyor station;

a digital metal detector means for separating out non-ferrous metal, such as aluminum cans, from the remaining assortment of trash, said second metal detection means including means for generating a transaction complete signal if no aluminum cans are detected for a pre-determined period of time indicating that the depositor is done placing said assortment of trash into the input hopper means;

means responsive to the detection of heavys and to the detection of non-ferrous metals such as aluminum cans for dropping heavys and non-metals, such as plastics, paper items, glass, and the like, into a non-metal and heavys receptacle;

weighing means including a weighing bucket whose weight is initially zeroed for weighing the crushed aluminum cans deposited therein on a continuous basis, means for sensing when the weight bucket is full and generating a full signal in response thereto, means responsive to at least one of said full signal and said transaction complete signal for initiating a cycle pause, taking a final weight reading, and activating a door dump solenoid to open the bucket door and drop the contents thereof, and means for reclosing the door and ending the cycle pause to begin weighing again;

crusher means receiving aluminum cans from the second separator conveyor station of said separator means for crushing said cans and emptying the crushed aluminum cans into said weight bucket, said crusher means being responsive to said cycle pause for shutting off for permitting incoming aluminum cans to be stored at the input thereof until crushing resumes when the cycle pause is ended, said crusher means further including detector means operatively disposed at the input thereof for generating a full alarm signal if too many aluminum cans accumulate at the crusher input;

a storage bin conveyor means for transporting crushed aluminum cans from a first storage bin conveyor station to a second storage bin conveyor station;

said input conveyor means, said separator conveyor means and said storage bin conveyor means operating on a continuous basis from the time a depositor activates the start means and begins placing said assortment of trash into the input hopper means until the cycle is complete and a transaction complete signal is received, said conveyors being responsive to various alarm signals indicative of a need to stop the conveyors for shutting down the continuous mode of operation until the alarm condition is cleared;

lateral transfer means operatively disposed proximate the output of said weight bucket for receiving crushed aluminum cans dumped from said weight bucket and transferring the said crushed aluminum cans to said first storage bin conveyor station;

a storage bin means operably disposed proximate the second storage bin conveyor station for transferring the conveyed crushed aluminum cans to said storage bin for temporary storage therein;

coin dispenser means responsive to control signals for dispensing compensation to the depositor in accordance with the measured weight of aluminum cans deposited, said coin dispensing means including means for detecting a coin jam and an out-of-coins condition and for generating an out-of-money alarm signal in response thereto, said coin dispenser means being responsive to control signals for periodically dispensing the highest valued coin therein each time a weight of crushed aluminum cans corresponding thereto is weighed, and for dispensing the remaining coins to provide compensation to the nearest one cent whenever a pause cycle occurs indicating that the weighing bucket is full or when the transaction is complete;

display means operably disposed to the depositor of aluminum cans for displaying thereto alarm conditions, an out-of-order condition, a separate out-of-money light, a continuous display of weight in some even integral amount, a continuous display of compensation calculated in the largest denomination coin present in the dispenser means, and for dispensing said coin for each weight unit corresponding thereto, and for displaying the full total weight to the nearest tenth and hundredth of a pound and the final total compensation to the nearest cent when the weighing bucket is full and when the transaction is complete;

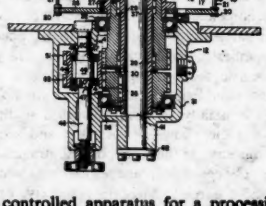
microprocessor-based control means responsive to alarm signals, weight readings, start signal, compensation rate, time delays, and monitored status information for generating various control signals for controlling the operation of the present signal, said control means rechecking alarm conditions at periodic intervals for restoring system operation if the problem has been solved.

4,597,488

PHASE CONTROLLED APPARATUS FOR A PROCESSING OPERATION

Joseph A. Lynch, Hillsdale, and Daniel Ignatuk, Morris Plains, both of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Dec. 13, 1982, Ser. No. 449,454
Int. Cl.[4] B65G 47/00
U.S. Cl. 198—339.1 **22 Claims**



1. Phase controlled apparatus for a processing operation comprising in combination an article conveyor including a curved section equidistant from a vertical axis, processing means driven by said conveyor including a turret mounted to rotate about said axis for operating upon the articles being conveyed along said curved section, said turret having multiple heads each positioned to track an article as it is carried

along said curvey conveyor section, wheels means mounted for rotation about said axis and driven by said conveyor, and a phase control device operatively interposed between said conveyor and said processing means, said phase control device including a first gear mounted for rotation with said wheel, a second gear mounted to rotate with said turret, at least one of said gears being a helical gear, said first and second gears being independently journalled and having teeth angled in different directions, a gear member having a first gear element meshing with said first gear and a second gear element meshing with said second gear, said gear elements being locked against relative rotational movements, said gear member being mounted for rotation about a second axis parallel to said first mentioned axis, said turret being driven by said conveyor through said first and second gear element, and means for moving said gear member axially with respect to said first and second gears whereby the relative rotational position of first and second gears is changed resulting in a change in the alignment of the turret heads with the articles conveyed.

4,597,489

CONVEYOR FOR TRANSPORTING WHEEL RIMS DURING ROLL SHAPING

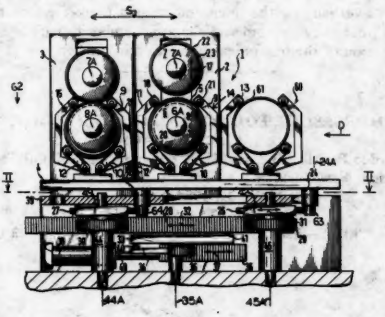
Hugo Junklewitz, Leichlingen, Fed. Rep. of Germany, assignor to Th. Kieserling & Albrecht GmbH. & Co., Solingen, Fed. Rep. of Germany

Filed Dec. 10, 1984, Ser. No. 679,900

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1983, 3344797

Int. Cl.⁴ B65G *25/00*

U.S. Cl. 198—468.2 **8 Claims**



1. In combination with a pair of similar rim-shaping machines having respective parallel working axes and each open to receive a workpiece only parallel to the respective axis, a conveyor for transporting the workpiece between the machines, the conveyor comprising:

a table displaceable parallel to the axes and in a transport direction transverse thereto;

a pair of similar workpiece holders spaced apart in the transport direction on the table;

a guide pin projecting vertically from the table;

guide means engaging the pin and defining therefor a generally U-shaped transport path having two straight legs extending parallel to the axes, a straight bight extending parallel to the direction, and a pair of rounded corners connecting the respective legs to the bight;

actuator means for displacing the pin and table connected therewith along the path; and

means for maintaining the table parallel to the direction during travel of the pin along the path.

4,597,490

DEVICE FOR LIFTING, TRANSFERRING AND DEPOSITING OBJECTS

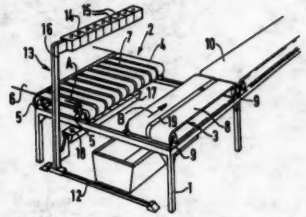
Olivier Selignan; Olivier Bourgain, and Jean-Marie Martin, all of Paris, France, assignors to Chaussures Andre, Paris, France

Filed Feb. 8, 1985, Ser. No. 699,616

Claims priority, application France, Jun. 15, 1984, 84 09395

Int. Cl.⁴ B65G *47/92*

U.S. Cl. 198—468.5 **5 Claims**



1. A device for the lifting, transference and depositing of objects comprising:

(a) a lifting surface having openings smaller than the objects, which are capable of receiving the objects to be lifted;

(b) a deposit surface having openings smaller than the objects, which are capable of receiving objects to be deposited;

(c) a transfer assembly movable between a first and a second position, said transfer assembly including an upper element constituted by a group of electro-magnets with substantially vertical line of action, arranged so that when the transfer assembly is in the first position the electromagnets are substantially above the lifting surface, their lines of action being capable of intercepting objects received on the said lifting surface and above the openings of this surface, and that when the transfer assembly is in the second position the electromagnets are substantially above openings of the deposit surface, a lower element constituted by a group of counter-magnets associated with the electromagents, arranged in such manner that when the transfer is in the first position the counter-magnets are situated beneath the lifting surface on the line of action of the electromagnets and at a distance permitting this action, the counter-magnets being smaller tha the openings of the lifting surface and those of the deposit surface;

(d) means for displacement of the transfer assembly between its first and its second position;

(e) means for control of the electromagnets; and

(f) means for recuperation of the counter-magnets, capable of collecting them beneath the openings of the deposit surface and replacing them in the position which they occupy when the transfer assembly is in the first position.

4,597,491

TRUCK LOADING APPARATUS AND METHOD

Glenn T. Conklin, Fremont, Mich., assignor to Gerber Products Company, Fremont, Mich.

Filed Apr. 5, 1984, Ser. No. 597,141

Int. Cl.⁴ B65G *31/02, 31/04*

U.S. Cl. 198—642 **14 Claims**

1. A material throwing apparatus comprising:

inlet means for entry of the material into the apparatus;

means, including a belt, for conveying said material along a path within the apparatus;

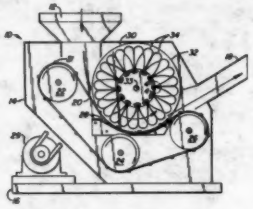
a rotor assembly means, including a plurality of radially extending semi-flexible loops positioned adjacent one another wih adjacent loops supporting one another to reduce deflection of the loops in a rotary direction, the outer ends of said loops defining a flexible, circular, rotatable circumferential surface, a portion of which circum-

ferential surface opposes a portion of the belt, for urging said material into contact with the belt; and

discharge means for exit of said material from the apparatus.

14. A method for loading fruit, vegetables or other material to a trailer or other bulk container comprising:

placing said material onto a moving belt;



urging said material into contact with said belt with a rotor assembly comprising a plurality of flexible loops mounted in a circular arrangement so that the outer ends of said loops form an essentially continuous circumferential surface for contacting the material to be moved; and

discharging said material into the bulk container.

4,597,492

CONVEYOR CHAIN

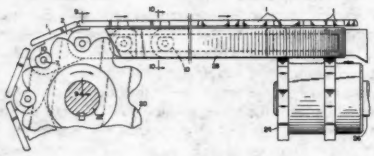
Leif Lachonius, Surte, and Carl Ullberg, Lerum, both of Sweden, assignors to Aktiebolaget SKF, Goteborg, Sweden

Continuation of Ser. No. 413,136, Aug. 30, 1982, abandoned. This application Apr. 17, 1985, Ser. No. 724,028

Claims priority, application Sweden, Sep. 30, 1981, 8105758

Int. Cl.[4] B65G *17/06*

U.S. Cl. 198—852 **2 Claims**



1. A conveyor assembly comprising a main frame including side rails having confronting grooves and an endless conveyor chain having a plurality of interconnected links, each link comprising a main portion (2) and a portion with two legs (3,4) extending from the main portion and enclosing the main portion of an adjacent link, the main portion having a cylindrical bore (5) generally perpendicular to the direction of motion of the chain, a cylindrical element (6) being rotatably arranged in said bore, a pin (7) arranged generally perpendicular to the direction of motion of the chain and to said bore extending between the two legs on either side of the cylindrical element (6) and through the main portion (2) of an adjacent link, the pin being arranged in the cylindrical element and in the respective legs, characterized by trunnions (10, 11) extending outwardly in opposite directions from the legs and being provided with bores (9) for taking up the pin (7), said pin being fixedly secured to the cylindrical element (6) and freely rotatably mounted in the bores (9) in the trunnions (10, 11), said trunnions engageable in said grooves for supporting and guiding said links and drive means engageable with the trunnions for actuating the conveyor chain, said pin being press fitted in a bore (12) in the cylindrical element (6), said element being of an elastically deformable material and the pin having a recess (14) in which a corresponding protrusion (13) in the bore of the element is snapped when the pin is brought into position in the bore during interconnection of two chain links.

4,597,493

INSTRUMENT PROTECTOR

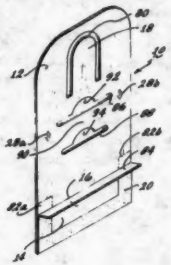
Loran H. Bruso, Ontario, Calif., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 517,553, Jul. 27, 1983, Pat. No. 4,506,787. This application Oct. 30, 1984, Ser. No. 666,410

The portion of the term of this patent subsequent to Mar. 26, 2002, has been disclaimed.

Int. Cl.[4] B65D *65/44*

U.S. Cl. 206—363 **8 Claims**



1. A device insertable into an envelope for immobilizing and protecting a jointed medical instrument of operatively associated parts within the envelope with parts thereof apart during a sterilization process which comprises:

a support member having a pair of generally parallel transverse slots forming an integral strap for holding the removable instrument against said support member; and

a transparent sheet overlying a portion of said support member and joined thereto along a sufficient portion of the margin of said support member to form an open-ended pocket thereover and having a projection of said sheet overhanging the open end of said pocket which can be folded away from said support member to facilitate insertion of the instrument tips into said pocket.

4,597,494

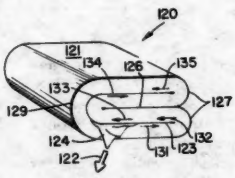
HORSESHOE FOLDED AND CENTER UNWOUND PLASTIC BAGS

Gordon Benoit, Macedon, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 31, 1984, Ser. No. 687,792

Int. Cl.[4] B65D *85/67*

U.S. Cl. 206—390 **23 Claims**



1. A plastic bag dispensing assembly from which large attached plastic bags are tensionally dispensed with minimized twisting, comprising:

A. A coreless would roll of said attached plastic bags which are attached but separated by transverse lines of perforations, said roll having an outer diameter, an inner diameter, D_i, and an inner circumference, πD_i, the length of said bags between said lines of perforations being at least equal to said circumference, whereby said minimizing of untwisting is imparted, said attached plastic bags beginning with an innermost bag and ending with an outermost bag,

and said roll being flattened, whereby said inner diameter forms a line having a length calculated as $\pi D_i/2$, and horseshoe-folded along at least one fold line in parallel to said lines of perforations, whereby said minimizing of untwisting is preserved; and

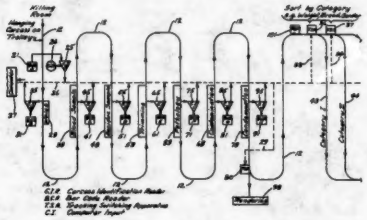
B. a dispensing carton within which said horseshoe-folded roll is stored, said carton having a dispensing opening through which said innermost bag is initially pulled by a user for dispensing thereof.

4,597,495

LIVESTOCK IDENTIFICATION SYSTEM

Austin T. Knosby, R.R. #1, Cumming, Iowa 50061

Filed Apr. 25, 1985, Ser. No. 727,352
Int. Cl.[4] B07C *3/18*; A22C *18/00*
U.S. Cl. 209—3.3 **12 Claims**



1. Apparatus for identification of animals passing through a packing plant comprising:

an elevated track means extending through a packing plant for guiding carcasses through various processing and testing stations;

a plurality of trolley means for moving along said track means;

gambrel means for attaching an animal carcass to each of said trolley means;

trolley identification means operably attached to each of said trolley means for providing positive identification of each individual trolley means;

animal identification means attached to each carcass to be hung from each gambrel means for providing individual carcass identification information;

a computer;

trolley identification reader means disposed adjacent to said track means for automatically reading each one of said trolley identification means as it passes by said trolley identification reader means;

means for inputting said trolley identification to said computer;

carcass identification reader means disposed adjacent to the path of the carcasses being moved along said track means by said trolley means;

means for inputting the carcass information from said carcass identification means into said computer; and

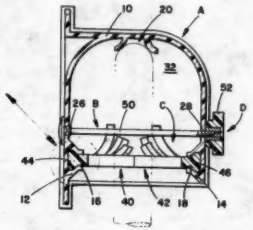
program means for said computer for performing various tasks including matching the trolley identification with the carcass identification information for the carcass hanging from each respective trolley means whereby each said carcass can be identified from the trolley means from which it is hanging.

4,597,496

FRICTIONAL GRIP TOOL HOLDER

Steve E. Kaplan, Elyria, Ohio, assignor to Pioneer Products, Inc., Elyria, Ohio

Filed Nov. 15, 1982, Ser. No. 441,608
Int. Cl.[4] A47F *5/08*
U.S. Cl. 211—70.6 **13 Claims**



1. A holder for frictionally retaining objects such as tools, the holder comprising:

a housing including oppositely disposed first and second mounting channels which define a generally horizontal, planar region therebetween, the first and second mounting channels being generally U-shaped with first and second open sides facing toward each other, the first mounting channel having a first projection adjacent the first channel open side extending upward for urging a received finger array against gravitational force and the second mounting channel having a second projection adjacent the second channel open side extending upward for urging a received finger array against gravitational force;

a first array of resilient fingers which have free ends and which are mounted adjacent mounting ends in the first mounting channel;

a second array of resilient fingers which have free ends contiguous to the first finger array free ends and which are mounted adjacent mounting ends in the second mounting channel; and,

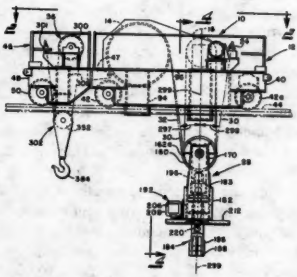
an adjusting means for selectively controlling the spacing between the free ends of the first and second resilient finger arrays.

4,597,497

HOIST WITH REDUNDANT SAFETY FEATURES

Richard E. Aberegg, Alliance, Ohio, assignor to Koehring Morgan, Hanover, N.H.

Filed Dec. 16, 1981, Ser. No. 331,151
Int. Cl.[4] B66C *13/06, 13/16, 17/00, 11/02*
U.S. Cl. 212—147 **4 Claims**



1. A hoist with redundant safety features comprising:

a hoist support frame;

lifting drum means mounted on said hoist support frame;

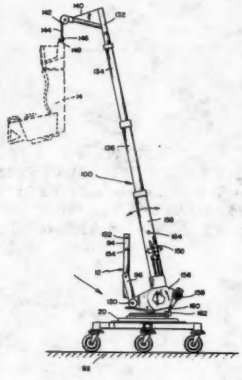
means for rotating said lifting drum means;
brake means for stopping the rotation of said lifting drum means;
load block assembly means;
equalizer assembly means mounted on said hoist support frame;
a first set of ropefalls and a second set of ropefalls; and an alarm;
said load block assembly means being suspended by said first set of ropefalls and said second set of ropefalls, each of said ropefalls having one end secured to said lifting drum means and the other end secured to said equalizer assembly means, each of said sets of ropefalls having sufficient load bearing capacity to carry the load carried by the other set of ropefalls in addition to its own load; each of said ropefalls having first sections extending from said lifting drum means to said load block assembly means and second sections extending from said load block assembly means to said equalizer assembly means, each of said first sections being positioned in a substantially common plane with each other, and each of said second sections being positioned in another substantially common plane with each other;
said equalizer assembly means including first means for balancing the load carried by said first set of ropefalls, second means for balancing the load carried by said second set of ropefalls, and load sensor means for generating an electrical signal in response to variations in the load carried by said first or said second set of ropefalls, said electrical signal being adapted for activating said brake means and/or activating said alarm,
said equalizer assembly including equalizer support means mounted on said hoist support frame,
said first means for balancing the load comprising a first ropefall support member pivotally mounted on said equalizer support means, the other ends of the ropefalls of said first set of ropefalls being secured to said first ropefall support member,
said second means for balancing the load comprising a second ropefall support member pivotally mounted on said equalizer support means, the other ends of the ropefalls of said second set of ropefalls being secured to said second ropefall support member,
said load sensor means comprising a first load sensor mounted on said equalizer support means adapted to sense the load carried by said first ropefall support member and to generate said electrical signal when said load carried by said first ropefall support member is varied beyond a predetermined level, and a second load sensor mounted on said equalizer support means adapted to sense the load carried by said second ropefall support member and to generate said electrical signal when said load carried by said second ropefall support member is varied beyond a predetermined level,
said equalizer support means comprising trunnion means pivotally mounted on said hoist support frame; an inner support member mounted on said trunnion means and extending downwardly from said trunnion means, said second ropefall support member comprising a second support beam pivotally depending from said inner support member; an outer support member mounted on said trunnion means and extending coaxially with said inner support member downwardly from said trunnion means, said first ropefall support member comprising a first support beam pivotally depending from said outer support member; the other ends of the ropefalls of said first set of ropefalls being secured to said first support beam, the other ends of the ropefalls of said second set of ropefalls being secured to said second support beam.

4,597,498

MOBILE MAINTENANCE STAND AND CRANE APPARATUS

Dominic J. Spinosa, Wantagh, and Frank Knoll, Huntington Station, both of N.Y., assignors to East/West Industries, Inc., Hauppauge, N.Y.

Continuation of Ser. No. 435,905, Oct. 22, 1982, abandoned. This application Dec. 14, 1984, Ser. No. 681,831
Int. Cl.[4] B66C *23/06*
U.S. Cl. 212—189 **19 Claims**



1. A mobile maintenance stand for servicing and transporting ejection seats, comprising
(a) a lower generally flat base portion having;
(i) a plurality of equally spaced radially extendable arms,
(ii) rotatable means disposed proximate the distal ends of each of said arms for providing movement of said stand along a surface,
(iii) said extendable arms having at least a first and a second section, said seacond section being removably affixed to said first section of each said arms providing sway bracing means for additional stability, and
(iv) removable rigidity means for providing rigidity to said lower base portion, one of said removable rigidity means being disposed proximate the distal ends of said first or said second arm sections of each of said arms; and
(b) an upper generally flat base portion rotatably affixed to said lower base portion having;
(i) a pair of articulated arms disposed in an upwardly direction adapted to removably retain one of said ejection seats therebetween, and
(ii) means for adjusting said articulated arms to anyone of a plurality of positions for performing maintenance on said ejection seat.

4,597,499

BIASED PIN RETAINER BLOCK FOR A ROTARY COUPLING SYSTEM

Richard M. Hanula, 5012 N. Barton Rd., Lyndhurst, Ohio 44124

Filed Jun. 20, 1984, Ser. No. 622,533
Int. Cl.[4] B61G *9/00*
U.S. Cl. 213—50.5 **18 Claims**

1. A rotary coupling system for rail cars and the like, comprising:
a coupler having a shank portion including an aperture extending transversely therethrough;
connector means having an end opening for receiving the shank and a pair of spaced apart coaxial apertures alignable with said shank aperture, said connector means being

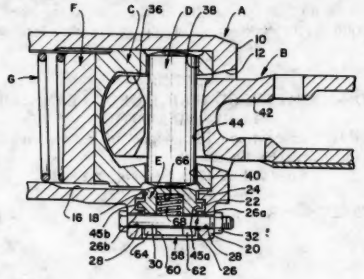
rotatable about an axis of rotation normal to the axis of said aligned apertures;

fastening means insertable into said aligned connector means apertures and said shank aperture for selectively interconnecting said coupler and connector means;

a yoke for rotatably retaining said connector means, said yoke having an opening which is alignable with said connector means apertures and said coupler shank aperture and adapted to receive the fastening means therethrough;

retaining means for retaining said fastening means in a connecting position with said connector means apertures and said shank aperture, said retaining means being selectively insertable into said yoke opening for closing said opening and further including a locking means for selectively locking said retaining means in a closing position in said yoke opening;

compressible biasing means comprising a compression spring operatively communicating with said retaining



means for placing a continuous biasing force thereagainst for urging said retaining means axially inward of said yoke opening toward the fastening means; and,

first limit means for defining an inward limit of movement of said retaining means in said yoke opening and second limit means for defining an outward limit of movement of said retaining means in said yoke opening wherein said yoke opening includes first inner and second outer support surfaces extending circumferentially thereof in axial spaced relation to each other, said first and second support surfaces defining said first and second limit means, respectively, said retaining means including radially outward extending support areas receivable between said first and second support surfaces, the distance between said surfaces being a predetermined amount greater than the thickness of said support areas for allowing said retaining means to undergo predetermined amount of axial movement.

4,597,500

TAMPER-RESISTANT CLOSURES FOR CONTAINERS

Peter Stubbs, Dartford, United Kingdom, assignor to Johnsen & Jorgensen (Plastics) Ltd., London, England

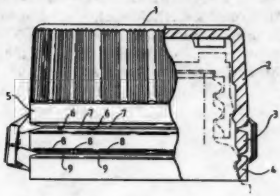
Filed Feb. 26, 1985, Ser. No. 705,664

Claims priority, application United Kingdom, Mar. 1, 1984, 8405427

Int. Cl.[4] B65D *41/48*

U.S. Cl. 215—256 **4 Claims**

1. A tamper-resistant container closure comprising a cap, including a top and a depending annular skirt arranged so that the cap can be removed from its operative position on the container without mutilation or destruction of the cap in order to open the container and can then be replaced in its operative position to close the container again, and a tamper-resistant tear band having an edge connected to the lower edge of the skirt of the cap and so arranged that the tear band has to be removed from the closure before the cap can be initially removed from the container, characterized in that the tear band is firmly connected to the lower edge of the skirt of the cap by a number of spaced apart relatively strong frangible nibs which each firmly connect the edge of the skirt to the edge of the tear band, and that the spaces between the nibs are each filled by a relatively weak thin web of material, whereby the band must



be pulled with a greater force to cause the connection of the tear band edge and the skirt edge established by the nibs to fail, than a force required to tear the thin web of material.

4,597,501

BOTTLE AND CLOSURE HAVING ANGULAR POSITIONING MEANS

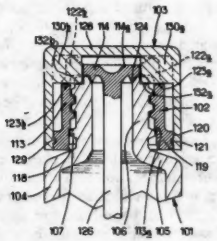
Jean-Louis H. Gueret, Paris, France, assignor to L'Oreal, Paris, France

Filed Oct. 10, 1984, Ser. No. 659,547

Claims priority, application France, Oct. 13, 1983, 83 16298; May 10, 1984, 84 07200

Int. Cl.[4] B65D *41/09*

U.S. Cl. 215—330 **6 Claims**



1. In a bottle comprising:

(a) a neck;

(b) external thread means on said neck;

(c) a detachable stoppering device;

(d) internal thread means on said stoppering device cooperable with said external thread means of the neck of the bottle;

(e) means effective to ensure the angular positioning of the stoppering device in relation to the bottle, the latter means comprising

(i) stop means carried externally in the neck, above the thread means thereof, and

(ii) protuberance means carried internally by the stoppering device, said protuberance means being positioned and dimensioned so that when the stoppering device has been completely screwed down the protuberance means abuts said stop means of the neck, wherein said stoppering device is constituted by a stoppering cap and by a presentation cap fitted on the stoppering cap and at least partly covering it, the said stoppering cap being constituted by a cylindrical skirt joined to the top of said stoppering cap, said skirt carrying said internal thread means cooperating with the corresponding external thread means of the neck;

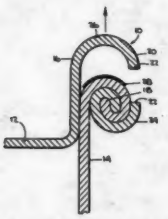
the improvement wherein said protuberance means is carried by the presentation cap and is in the form of a fin which is engaged in a slot in the wall of said cylindrical skirt near the periphery of said top thereof.

4,597,502

INDUSTRIAL CONTAINER WITH REMOVABLE END CLOSURES AND METHOD OF MANUFACTURE

Thomas D. Troughton, Richmond, Calif., assignor to Rheem Manufacturing Corporation, New York, N.Y.

Continuation of Ser. No. 349,039, Feb. 16, 1982, abandoned.
This application Aug. 2, 1984, Ser. No. 636,798
Int. Cl.[4] B23K *31/06*
U.S. Cl. 220—67 5 Claims



1. A method of manufacturing an industrial container comprising the steps of: assembling an end closure element to a container shell; forming a temporary circumferential joint between said closure element and said shell by jointly curling the periphery of said closure element with the rim of said shell to form a sprial seam with said closure element on the outside; severing the outermost layer of said spiral seam along a line circumferential of said joint at a point of maximum joint circumference to provide a separable seam to permit separation of said closure element from said shell; and perfecting said joint by disposing a locking ring about the assembled component parts of said separable seam so that said locking ring is contiguous with the outer most layer of said spiral seam at said point of maximum circumference.

5. An industrial container having an end closure element assembled to a container shell with a circumferential joint between said closure element and said shell, said joint being in the form of a spiral seam in which the periphery of said closure element and the rim of said shell are jointly curled with the closure element on the outside, a circumferential line of severance through the outermost layer of said spiral seam at a point of maximum seam circumference such that in the the absence of a locking ring said end closure element is separable from said shell, and a locking ring embracing said spiral seam to preclude separation of said closure element from said shell, said locking ring being continguous with the outer most layer of said spiral seam at said point of maximum circumference.

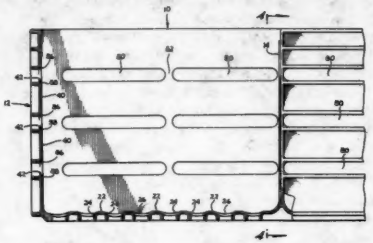
4,597,503

UNITARY MOLDED CITRUS CRATE

Kornel Lates, Thornhill, Canada, assignor to Scepter Manufacturing Co. Ltd., Toronto, Canada

Filed Dec. 18, 1984, Ser. No. 683,916
Int. Cl.[4] B65D *1/38, 1/42*
U.S. Cl. 220—83 3 Claims

1. A one piece molded citrus crate comprising first and second substantially parallel sidewalls, first and second substantially parallel end walls and a bottom, said first and second sidewall, said first and second end walls and said bottom being integrally connected at the edges thereof to define an open top rectangular crate-like structure, said bottom being slotted so as to define a plurality of interconnected slat-like members, said slat-like members having a smooth convex curvature adjacent the edges thereof adjacent the interior of the crate, said first and second end walls each also having at least one horizontal slot therethrough proportioned to form a convenient hand hold, the edges of said horizontal slot of each of said first and second end walls facing the interior of said crate being bevelled such that the edges forming the slot are recessed into said slot to a mold parting line within said slot, whereby the interior of said crate is free of sharp edges in the interior thereof contactable in normal use by citrus stored therein, and wherein the



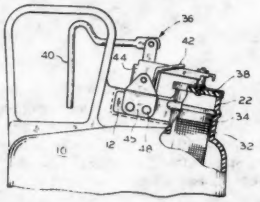
edge of each of said horizontal slots closer to the open top of said crate is recessed by a substantially flat chamfer thereon.

4,597,504

NON-METALLIC CONTAINER FOR FLAMMABLE FLUID AND METHOD

Edward H. Witt, Mattoon, Ill., assignor to Justrite Manufacturing Company, Des Plaines, Ill.

Filed Jul. 5, 1985, Ser. No. 751,892
Int. Cl.[4] B65D *25/00*
U.S. Cl. 220—88 R 12 Claims



1. In a container for flammable fluids having an insulating plastic container body, metallic structural handle member means carried on said plastic container, a delivery port, and a metallic screen flame arrestor positioned across said delivery port, the improvement comprising, in combination:

an insert sealed within said plastic container body in contact with both said structural handle member means and said screen flame arrestor, said insert comprising an electrically conductive mixture of a plastic which is sealingly compatible with the plastic of said container body and a finely divided, electrically conductive material, whereby differences in static electric potential between said screen flame barrier and the structural handle member means are minimized, to eliminate static electric sparks.

4,597,505

RUPTURE DISC WITH SELECTIVELY POSITIONED INITIAL BUCKLING

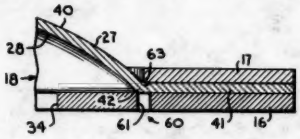
Robert M. Mozley, Raytown, and Bryce H. Wilson, Kansas City, both of Mo., assignors to Continental Disc Corporation, Kansas City, Mo.

Filed Apr. 9, 1984, Ser. No. 598,457
Int. Cl.[4] F16K *17/16, 17/40*
U.S. Cl. 220—89 A 16 Claims

15. In a reverse buckling rupture disc assembly including a disc having a centrally located pre-bulged dome with a concave side, a convex side and a crown, a flange extending radially outward from said dome and a transition region between said dome and said flange and further including a downstream support ring for supporting said disc on the concave side thereof and having a substantial opening therethrough opposite said dome; said support ring having upper and lower sub-

stantially parallel and planar surfaces; the improvement wherein:

(a) said support ring includes a failure initiating discontinuity therein on the planar surface operably positioned immediately beneath and directly adjacent a first portion of said transition area which is generally closest to a location on the dome whereat initial buckling is desired; said discontinuity being located within the planes of said substantially parallel and planar surfaces; and



(b) said support ring supports substantially all of the transition area outside said transition area first portion;

(c) whereby when said disc has sufficient differential pressure applied to said convex side to cause buckling of said dome, said dome first buckles between said dome crown and said failure initiating depression.

4,597,506

BEVERAGE DISPENSING MACHINE

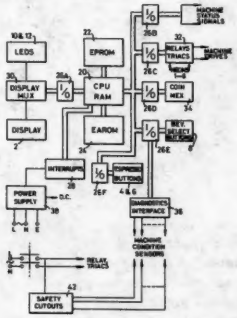
David Eglise, Windsor, and Edward C. Horton, Maidenhead, both of England, assignors to Mars Limited, London, England

Filed Apr. 12, 1983, Ser. No. 484,158

Claims priority, application United Kingdom, Apr. 15, 1982, 8210923

Int. Cl.[4] G07F *13/10*

U.S. Cl. 221—6 **24 Claims**



1. A beverage dispensing machine operable in a beverage dispensing mode in which a beverage may be selected by a user and at least one machine function mode in which an operator may change machine characteristics and functions, said beverage dispensing machine including a plurality of user selection keys each enabling a user to select a beverage from a range thereof when said machine is in said beverage dispensing mode, a corresponding plurality of first visual display means, one each associated with each user selection key for displaying whether or not a selected beverage is available for dispensation when said machine is in said beverage dispensing mode, and second visual display means for indicating credit functions to a user when said machine is in said beverage dispensing mode, said user selection keys having multiplexed functions so that when said at least one machine function mode is enabled said user selection keys enable an operator to select a beverage for which machine characteristics and functions are to be changed and to change those machine characteristics and functions by using one or more of said user selection keys and wherein at least one of said first and second display means is arranged to display machine states in addition to the beverage availability and credit function states in the beverage selection mode.

4,597,507

APPARATUS FOR METERING AND FEEDING A SOLUTION

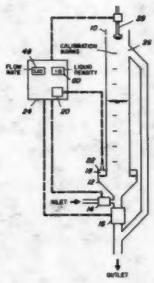
Frank Rosenblum, St. Laurent, and Vladimir M. Labuc, Hudson, both of Canada, assignors to Noranda Inc., Toronto, Canada

Filed Jun. 25, 1984, Ser. No. 624,287

Claims priority, application Canada, Jul. 21, 1983, 432947

Int. Cl.[4] B67D *5/30, 5/32*

U.S. Cl. 222—16 **5 Claims**



1. An apparatus for metering and feeding a predetermined volume of solution to a chemical process or other receiving system, said apparatus comprising:

(a) a container;

(b) an inlet valve for feeding a solution into said container;

(c) an outlet valve for allowing the solution fed into the container to flow out of the container when operated;

(d) a chamber located in the lower part of the container and adapted to trap air during filling of the container at a pressure which corresponds to the hydrostatic head of solution in the container;

(e) a pressure transducer connected to said chamber and adapted to provide an output signal proportional to the volume of solution in the container; and

(f) control means responsive to the output of the transducer for closing said inlet valve when said predetermined volume of solution is reached and opening said outlet valve to allow discharge of the solution, said control means including an electronic circuit for regulating and controlling a cycle of closing said inlet valve and opening said outlet valve several times in a preselected time interval so as to provide a desired flow rate of solution and an alarm sensor responsive to said electronic circuit for providing an alarm when a new cycle is initiated by the electronic circuit prior to said predetermined volume of solution being reached.

4,597,508

COMBINED CLOSURE AND POURING SPOUT

Bernard G. MacLarty, Germiston, South Africa, assignor to Van Leer S.A. (Proprietary) Limited, Parktown, South Africa

Filed Jun. 27, 1984, Ser. No. 625,019

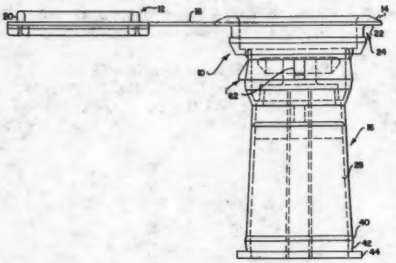
Claims priority, application South Africa, Jun. 27, 1983, 83/4687

Int. Cl.[4] B67B *7/24*

U.S. Cl. 222—83 **7 Claims**

1. A one-piece moulded closure and pouring spout for a container, the closure and spout comprising a sleeve-like neck

for fitting in a filling opening of a container with an upper end portion outside of the container and a lower end portion inside the container, an elongate pouring spout having a sleeve-like side wall and a transverse wall, the spout being suspended from the lower end portion of said neck by a frangible diaphragm which is moulded integrally both with said neck and said side wall and which encircles said side wall, the spout having a



minor upper portion which lies within said neck and a major lower portion which hangs down below said neck, said transverse wall and said side wall of the spout being moulded integrally with one another and said side wall lying within said major portion, and an outlet opening in said side wall between the end of the spout remote from said minor portion and said transverse wall.

4,597,509

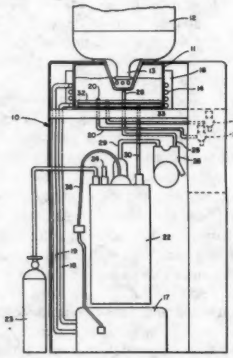
DRINKING WATER DISPENSING UNIT AND METHOD

LeRoy A. Pereira, LaCanada, Calif., assignor to McKesson Corporation, Los Angeles, Calif.

Filed Nov. 13, 1984, Ser. No. 671,120

Int. Cl.[4] B67D *5/56, 5/62;* **F02M** *31/00*

U.S. Cl. 222—129 **4 Claims**



1. A drinking water dispensing unit for dispensing uncarbonated and carbonated drinking water comprising:

(a) a reservoir for retaining uncarbonated drinking water;

(b) refrigerator means for circulating a fluid refrigerant;

(c) first heat exchange means in thermal heat transfer relationship with the reservoir;

(d) piping connecting the first heat exchange means to the refrigerator means whereby refrigerant is caused to circulate through the heat exchange means to cool and maintain the water in the reservoir at a desired temperature;

(e) a carbonator unit for dispersing carbon dioxide in water under pressure, the carbonator unit having an inlet for receiving water to be carbonated and an outlet for the discharge of carbonated water;

(f) a second heat exchange means in heat transfer relationship with water in the reservoir, said second means having an inlet and an outlet;

(g) a pump having an inlet and an outlet; piping connecting the pump inlet with the interior of the reservoir and connecting the pump outlet to the carbonator, whereby operation of the pump takes water from the reservoir and delivers it to the carbonator;

(h) piping connecting the outlet of the carbonator to the inlet of the second heat exchange means;

(i) two manually operated dispensing faucets;

(j) piping connecting one of the faucets to the interior of the reservoir to receive uncarbonated water;

(k) piping connecting the other faucet to the outlet of the second heat exchange means whereby carbonated water is dispensed through the second faucet.

4,597,510

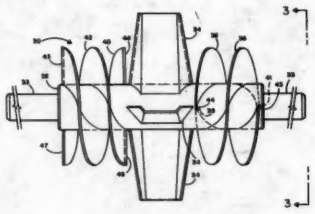
IMPELLER PACKING MACHINE WITH PRE-CONDITIONING HOPPER

Will G. Durant, Tustin, Calif., assignor to Westmont, Inc., Santa Fe Springs, Calif.

Continuation-in-part of Ser. No. 371,750, Apr. 26, 1982, abandoned. This application Mar. 2, 1984, Ser. No. 585,944

Int. Cl.[4] B65G *69/06, 33/26, 53/08;* **G01F** *11/20*

U.S. Cl. 222—195 **3 Claims**



1. A bag filling apparatus of the type used for delivering particulate material to a filling spout to which a bag to be filled is attached; the apparatus comprising:

a source of pressurized gas;

a pre-conditioning hopper having a chamber for containing a selected volume of particulate material, said chamber having a bottom surface comprising a porous dissemination pad through which said source of pressurized gas can forcefully direct such gas upwardly into said chamber for aerating and preventing compaction of said particulate material thereby permitting said particulate material to flow more freely; and

an impeller member having a longitudinally directed elongated cylindrical shaft to which a plurality of impeller blades are connected symmetrically along the wall of said shaft and from which extend radially helical feed screw flights, at least two such flights being in overlapping parallel relation to each other and each terminating adjacent, radially aligned, and longitudinally displaced from a different one of said impeller blades;

said feed screw flights communicating with said chamber, said impeller blades communicating with said spout for feeding said aerated particulate material to each said bag.

4,597,511

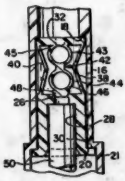
POSITIVE ONE-WAY CHECK VALVE

Anthony Licari, Pembroke Pines, Fla., assignor to AFA Consolidated Corporation, Hialeah, Miami Lakes, Fla.

Filed Jun. 14, 1982, Ser. No. 388,434

Int. Cl.[4] F16K *15/14*

U.S. Cl. 222—380 **12 Claims**



9. In combination with the intake bore of a liquid dispensing pump of the type having an outlet check valve and a discharge nozzle.

an inlet check valve comprising a one-piece integrally molded assembly adapted to be press fit in operative position in said bore,

said assembly having a top portion and a body portion,

said body portion including a valve seat and having a hollow interior,

said top portion having the shape of a cross and being adapted to fit loosely in said bore,

a compression member having at least one aperture therein, said aperture extending entirely through the compression member, said compression member being attached to said top portion in dependent relation,

a valve plug on said compression member, in operative press fitted position of said assembly in said bore, providing control of the flow of liquid through said bore by engaging said valve seat in a normally closed valve relation, and

flexible link means extending between the top portion and the body portion and forming a valve spring therebetween whereby compression of said assembly imparts a permanent compression force upon said valve plug that urges said valve plug to seat in said valve seat in said normally closed valve relation.

4,597,512

AEROSOL VALVES

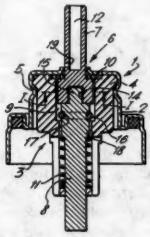
Kenneth Wilmot, Clitheroe, England, assignor to Neotechnic Engineering Limited, Lancashire, England

Filed Jun. 20, 1983, Ser. No. 506,161

Claims priority, application United Kingdom, Aug. 6, 1982, 8222670; Aug. 20, 1982, 8224022

Int. Cl.[4] B65D *83/14*

U.S. Cl. 222—402.2 **12 Claims**



1. A dispensing device for dispensing metered fluid doses from an aerosol container, the device comprising a valve body at least partially defining a generally cylindrical metering chamber, and an inlet duct having a uniform diameter including a continuous annular upper section adjacent to the metering chamber and a lower section having an opening through the wall thereof, a valve stem slidably moveable within the metering chamber and the inlet duct of said valve body, said valve stem comprising a first, upper portion having an outlet duct and constituting a discharge tube and a second, lower portion positioned within the metering chamber adjacent to the inlet duct, first sealing means between said first stem portion and the valve body at a discharge end of the metering chamber, and second sealing means on said second stem portion for sealing engagement with said inlet duct, said first and second sealing means adapted to have (a) an operative position in which the first sealing means closes the discharge end of the metering chamber, the outlet duct is closed and the second sealing means is positioned within the metering chamber to open the inlet duct to receive fluid to be dispensed, (b) a dispensing position in which the upper stem portion is displaced into the metering chamber to communicate the outlet duct with the metering chamber and with the second sealing means in engagement with the inlet duct to seal off a predetermined quantity of fluid in the metering chamber for dispensation, and (c) a filling position in which displacement of the lower stem portion is such that said second sealing means passes completely through and out of the annular upper section of the inlet duct providing a passageway for the charging fluid which is unobstructed by said second sealing means.

4,597,513

POURER PIPE

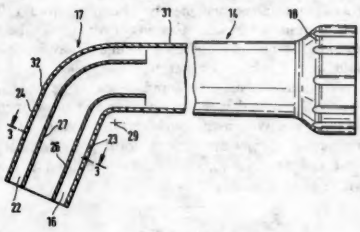
Wolfram Schiemann, Eugen-Nagele-Strasse 17, 7140 Ludwigsburg, Fed. Rep. of Germany

Filed Jul. 23, 1984, Ser. No. 633,720

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1983, 3328319

Int. Cl.[4] B67D *3/00*

U.S. Cl. 222—478 **12 Claims**



1. Pourer pipe for fitting on a can in the 5 to 20 liter range, having an outer wall, a securing end, a rigid, angled end part which can be introduced into the filler pipe of another container, and at least one vent passage in the end part in the region of the outer wall; comprising the improvement wherein

at least one additional vent passage is formed at least in the angled end part,

the vent passages are each formed from a sector of the outer wall and an inwardly domed partition issuing therefrom,

the cross-section of each vent passage occupies about 10 to 30% of the pipe cross-section,

the pourer pipe has a straight part extending from the bend of the angled end part to the securing end, which has a length of about 18 to 22 cm.,

the angled end part has a length of about 3 to 7 cm., and

the straight part extends from the angled end part at an angle of about 110°.

4,597,514

SLIDING GATE VALVES AND COMPONENTS THEREOF

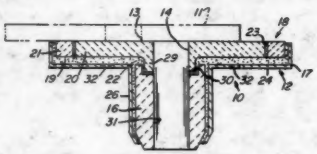
Anthony Thrower, Dronfield Woodhouse, England, assignor to USS Engineers and Consultants, Inc., Pittsburgh, PA

Continuation-in-part of Ser. No. 478,382, Mar. 24, 1983, abandoned. This application Oct. 27, 1983, Ser. No. 546,022

Claims priority, application Denmark, Mar. 29, 1983, 1445/83; Brazil, Mar. 30, 1983, PI8301641[U]; Australia, Mar. 31, 1983, 13123/83; Canada, Mar. 31, 1983, 425077; European Pat. Off., Mar. 31, 1983, 83103248.7; Rep. of Korea, Mar. 31, 1983, 1335/83; China, Apr. 1, 1983, 7211011; Hungary, Apr. 1, 1983, 1139/83; Japan, Apr. 1, 1983, 58-55363; United Kingdom, Apr. 1, 1983, 8209663

Int. Cl.[4] B22D *37/00*

U.S. Cl. 222—600 4 Claims



1. A valve plate assembly adapted for positioning in a mounting receptacle of a sliding gate valve for teeming molten metal, said assembly including a refractory portion having oppositely spaced, substantially parallel surfaces, one of which is a slide surface for engagement with the slide surface of a cooperating valve component, a teeming orifice extending transversely through said refractory portion and a metal casing enclosing substantially all but the slide surface of said refractory portion and having a teeming opening axially aligned and communicating with said refractory portion teeming orifice, the improvement comprising:

(a) said refractory portion being a composite structure including first and second refractory members each having one of their surfaces disposed in mutual coplanar relation to form the sliding surface of said refractory portion;

(b) said first refractory member being a fired refractory insert containing said teeming orifice and being surrounded by and detachably inset in a receiving opening in said second refractory member; and

(c) said metal casing containing at least one hole laterally spaced from said teeming opening and positioned subjacent to and within the peripheral boundary of said first refractory member to receive tooling for impacting said first refractory member to detach the same from said valve plate assembly.

4,597,515

APPARATUS FOR TURNING TUBULAR GARMENT PORTIONS

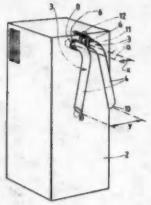
Ove Martinsen, Silkeborg, Denmark, assignor to OGM Trading ApS, Silkeborg, Denmark

Filed Jan. 15, 1985, Ser. No. 691,549

Int. Cl.[4] A41H *43/00*

U.S. Cl. 223—43 8 Claims

1. An apparatus for turning tubular garment portions such as sleeves of shirts and sweaters, comprising a suction box and a pair of turn tubes projecting from said suction box to respective outer, open ends thereof so as to be operable to suck in air through said outer ends and arranged so as to be operable to receive, at their outer ends, respective relevant base portions of tubular garment portions to be turned by suction into the turn tubes, said turn tubes being mounted so as to be adjustable with respect to the mutual distance between their said respective outer ends, wherein the turn tubes are mechanically held by rotatable holding means so that said turn tubes are pivotable about respective, substantially parallel pivot axes located adjacent the axes of the respective turn tubes and spaced from the



outer ends thereof, said pivot axes being substantially perpendicular to the axes of said turn tubes.

4,597,516

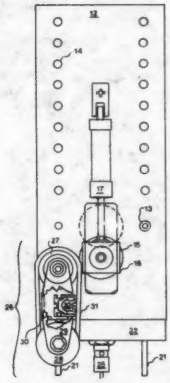
WEB FEEDER APPARATUS

Riley H. Mayhall, Jr., 14130 Columbia Rd., Burtonsville, Md. 20730, and Andrew Zudal, 4140 Mt. Olney La., Olney, Md. 20832

Continuation-in-part of Ser. No. 486,451, Apr. 20, 1983, abandoned, which is a continuation of Ser. No. 185,797, Sep. 10, 1980, abandoned. This application Sep. 17, 1984, Ser. No. 650,994

Int. Cl.[4] B65H *20/02*

U.S. Cl. 226—154 17 Claims



1. An apparatus for feeding thin flexible plastic film web material from a supply roll to a package wrapping apparatus of a package wrapping machine comprising in combination

a driven clamp feed roller;

a compression idler tractor roll assembly for engaging said clamp feed roller to form a nip between said roller and assembly for holding and feeding said web material;

said compression idler tractor roll assembly including one or more feed stripper belts for conveying and guiding a length of web material from said nip; and

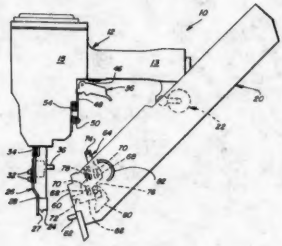
meas for moving said clamp feed roller into and out of engagement with said compression idler tractor roll assembly, whereby a loose portion of said web material may be fed to said package wrapping apparatus.

4,597,517

MAGAZINE INTERLOCK FOR A FASTENER DRIVING DEVICE

Mohamed K. Wagdy, Des Plaines, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed Jun. 21, 1985, Ser. No. 747,451
Int. Cl.[4] B25C *1/04, 5/06, 7/00*
U.S. Cl. 227—8 12 Claims



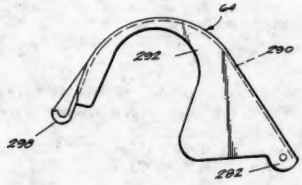
1. In a portable fastener driving device comprising a housing having a nose portion, a piston and cylinder means in said housing including a driver secured to said piston, which driver extends through a drive track defined by said nose portion, a fastener magazine connected to said housing adjacent said nose portion and positioned to dispose succeeding fasteners in said drive track, means for controlling the operation of said piston including a trigger assembly, a linkage assembly disposed adjacent said nose portion and said trigger assembly whereby said trigger assembly cannot be operated to drive a fastener into a workpiece until the nose portion of the tool is in engagement with the workpiece, said linkage assembly including a first member movably connected to said nose portion, spring means biasing said first member to extend beyond said nose portion, a second member connected to said magazine and a third member movably secured to said housing and biased away from said trigger but movable to render the trigger operational to drive a fastener.

4,597,518

STAPLER WITH IMPROVED MAGAZINE COVER CONSTRUCTION

Richard N. Paul, Coventry, R.I., assignor to Bostitch Division of Textron Inc., Providence, R.I.

Filed May 6, 1985, Ser. No. 730,575
Int. Cl.[4] B25L *5/04;* B27F *7/21*
U.S. Cl. 227—128 8 Claims



1. A stapling device comprising a housing defining a drive track, a staple driving element mounted in said drive track for movement through a staple driving stroke and return stroke, a magazine assembly for receiving and supporting a multiplicity of elongated staple preforms interconnected in generally abutting parallel row formation and wound up so as to form a roll having a leading end extending tangentially therefrom, means defining a guide path extending transversely with respect to said drive track for receiving the leading end of said roll and guiding same toward said drive track, means for feeding the leading staple preform of said leading end into said drive track as a formed staple for driving by said staple driving element during the staple driving stroke thereof, the improvement which comprises:

said magazine assembly including a frame structure operatively fixed with respect to said housing,

said frame structure having generally upwardly facing concave surface means for engaging and turnably supporting said roll at least at spaced positions beneath the central periphery thereof and generally upwardly facing surface means for engaging and slidably supporting the end portion extending from the roll at least at positions beneath the central extent thereof leading to said guide path,

a cover including a curved peripheral wall and a pair of marginal side walls along the curved edges of said peripheral wall,

means at a rearward end of said peripheral wall for pivotally connecting the cover to a rearward portion of said frame structure for movement about a transverse axis parallel to the axis of the roll between a closed operative position and an open access position,

the peripheral wall of said cover when the latter is in said closed operative position having a concavely downwardly facing configuration for upwardly enclosing a roll turnably supported on the upwardly facing concave surface means of said frame structure,

the side walls of said cover when the latter is in said closed operative position being spaced on opposite sides of the roll but enabling the sides of the roll to be exteriorly viewed,

a pair of transversely spaced locking elements fixed with respect to said frame structure,

said cover having locking surfaces adjacent the forward end portion thereof for engaging said locking elements to retain said cover in said operative position,

the material of said cover and the configuration of said peripheral wall and said side walls being such as to enable the forward end portion of said cover to be resiliently deflected in a direction toward the rearward pivoted end thereof so as to enable the locking surfaces of said cover (1) to be released from said locking elements to allow the cover to be moved out of its closed operative position into its open access position and (2) to be engaged with said locking elements when said cover is moved from its open access position into its closed operative position.

4,597,519

LEAD WIRE BONDING WITH INCREASED BONDING SURFACE AREA

John A. Kurtz; Donald E. Cousens, both of Saco, and Mark D. Dufour, Portland, all of Me., assignors to Fairchild Camera & Instrument Corporation, Cupertino, Calif.

Filed Feb. 27, 1984, Ser. No. 584,083
Int. Cl.[4] B23K *1/06, 31/02*
U.S. Cl. 228—102 15 Claims

10. An improved method for ball bonding the end of a lead wire held in the capillary bonding tool of a ball bonding machine to a die pad of an integrated circuit chip and for wedge bonding a segment of the lead wire spaced from the ball bond to a lead frame during successive ball bond wedge bond cycles, said method including the prior art steps of generating ultrasonic bonding energy and applying the ultrasonic bonding energy to the bonding tool for ball bonding and wedge bonding, applying a first bond force to the bonding tool during ball bonding, applying a second bond force to the bonding tool during wedge bonding, generating digital logic control signals for initiating and timing the steps of the ball bond wedge bond cycle, and generating a Z-motion analog velocity waveform for controlling motion of the bonding tool throughout the ball bond wedge bond cycle, wherein the improvements in the method comprise:

sensing the position and motion of the bonding tool during

the ball bond wedge bond cycle by sensing the Z-motion velocity waveform signal, detecting the Z-motion velocity waveform signal level and direction of change, and determining the location of the bonding tool according to the Z-motion velocity waveform signal level and direction of change;

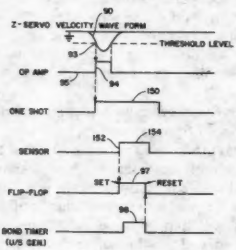
generating a first output signal corresponding to a first location of the bonding tool during motion of the bonding tool downward toward the die pad of an integrated circuit chip prior to contact by the bonding tool for ball bonding;

applying ultrasonic bonding energy to the bonding tool in response to the first output signal prior to contact of the bonding tool for ball bonding whereby bonding is initiated upon contact thereby increasing the bonding surface area;

generating a second output signal corresponding to a second location of the bonding tool during motion of the bonding tool downward toward a lead frame finger prior to contact of the bonding tool for wedge bonding;

applying ultrasonic bonding energy to the bonding tool prior to contact of the bonding tool for wedge bonding whereby bonding is initiated upon contact thereby increasing the bonding surface area.

13. An improved method for ball bonding the end of a lead wire held in the capillary bonding tool of a ball bonding ma-



chine to a die pad of an integrated circuit chip and for wedge bonding a segment of the lead wire spaced from the ball bond to a lead frame during successive ball bond wedge bond cycles, said method including the prior art steps of generating ultrasonic bonding energy and applying the ultrasonic bonding energy to the bonding tool for ball bonding and wedge bonding, applying a first bond force to the bonding tool during ball bonding, applying a second bond force to the bonding tool during wedge bonding, generating digital logic control signals for initiating and timing the steps of the ball bond wedge bond cycle, and generating a Z-motion analog velocity waveform for controlling motion of the bonding tool throughout the ball bond/wedge bond cycle, wherein the improvements in the method comprise:

electrically sensing initial contact of the bonding tool and lead wire with the die pad of an integrated circuit chip for ball bonding;

generating a bonding energy control signal in response to said electrically sensed initial contact;

and applying ultrasonic bonding energy to the bonding tool in response to said bonding energy control signal whereby ultrasonic bonding energy is applied to the bonding tool substantially upon initial contact for optimizing the bonding surface area of the ball bond.

4,597,520

BONDING METHOD AND MEANS

Kenneth L. Biggs, 3047 N. Valley View, Orange, Calif. 92667

Filed Sep. 6, 1984, Ser. No. 647,820

Int. Cl.[4] B23K *20/10*

U.S. Cl. 228—111 **19 Claims**

1. Apparatus for accomplishing bonding and severing of conductor wires at a work position, comprising:

a tool;

means for moving one end of the tool in the direction toward and away from said work position;

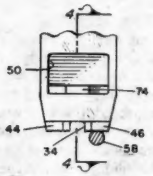
said one end of the tool comprising a work face extending substantially perpendicular to said direction from a forward edge to a rearward edge;

the work face being formed with a wire retaining groove extending across said face in a direction from said forward edge to said rearward edge;

said work face further being formed with conformations defining at least one chisel extending, at an associated side of said groove, in the direction normal to said groove; and

said tool further comprising means in the form of a wire retaining bail positioned opposite and spaced from said rearward edge of said work face for confining lateral movement of any wire extending through the bail toward said work face.

14. The method of completing an electrical connection between two circuit points with the aid of a tool having a working face formed in one region of said working face to define wire retaining conformations and formed at forward



edge of the working face to define a chisel, which method comprises the steps of:

completing a first bond between a length of lead wire and the first circuit point by utilizing said wire retaining groove to hold one end of the wire over said first circuit point while applying sonic energy to the wire and first circuit point through the tool;

thereafter, utilizing the tool to shape the lead wire and form it such that a portion of the wire along its length overlies the second circuit point;

thereafter, completing a second bond between the lead wire and the second circuit point by utilizing said wire retaining groove to hold said portion of the lead wire on the second circuit point while applying sonic energy to the lead wire and circuit point through the tool; and

thereafter, moving the tool such that said portion of the wire and the second circuit point do not underlie the tool, and then utilizing said groove to sever the wire adjacent the second bond by engaging the lead wire with said chisel of the tool while applying sonic energy over some interval of time to the chisel through the wire.

4,597,521

ROTARY NOTCHER FOR A JOINED METALLIC STRIP

Richard F. Wilson, Youngstown, Ohio, assignor to Wean United, Inc., Pittsburgh, Pa.

Filed Feb. 20, 1985, Ser. No. 703,580

Int. Cl.[4] B26D *1/62;* **B23K** *31/10*

U.S. Cl. 228—160 **11 Claims**

1. An apparatus for shearing and removing a predetermined portion of material along at its one longitudinal edge upon its path of travel, comprising:

drum means comprising at least two spaced-apart cooperative and rotatable drums, each having an axis of rotation and each located opposite said one longitudinal edge of said material,

means for mounting said drums transversely relative to said material in a manner their axis is in alignment relative to each other in a vertical plane and for retaining said drums

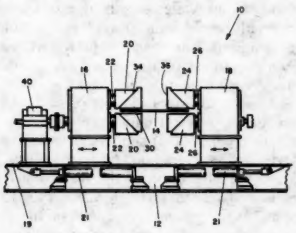
in a shearing and non-shearing relationship with said material,

said drums having cooperative arcuate surface areas and cooperative flat surface areas,

arcuate knife means mounted around said arcuate surface area of said drum forming a continuous predetermined radius and extending across said arcuate surface which begins and ends at opposite locations relative to said flat surface area thereof to give a predetermined edge cut having a slope between the beginning and end of the edge cut that will be a continuous radius and of a desired length and depth, and

means for synchronously rotating said drum means in relation to the speed of said material, including means for controlling the rotation of said drum means constructed in a manner so that in said inoperative mode said flat surface areas of said two drums oppose and are fixedly held adjacent each other so as not to be contacted by said travelling material, and in an operative mode said two drums commence to rotate in opposite directions but in the same direction of the travel of the material to bring said arcuate knife means on said each drum together in a cooperative contacting relationship with said material to effect said shearing and removing of said predetermined portion in said material.

7. A method for shearing and removing a predetermined portion along at least one longitudinal edge of a travelling metallic material, the steps comprising:



locating drum means along said longitudinal edge which drum means has at least two spaced-apart cooperative and rotatable drums between which said edge of said material passes and having an axis of rotation,

mounting said drums which have cooperative arcuate surface areas and cooperative flat surface areas on said drums, transversely relative to said material in a manner their axis of rotation is in alignment relative to each other in a vertical plane and retaining said drums in a shearing and non-shearing relationship with said material,

mounting arcuate knife means on said arcuate surfaces of said drums such as to produce a predetermined edge cut having a slope between the beginning and end of the edge cut that will be a continuous radius and of a desired length and depth, and

synchronously rotating the drums in relation to the travelling material, including controlling the rotation of the drums such that in a non-shearing mode, the flat surface areas of the two cooperative drums oppose and are fixedly held in position adjacent each other so as not to be contacted by the material, and in a shearing mode, causing the two drums to commence rotating in opposite directions but in the same direction as the travel of the material to bring the arcuate knife means on the drums together in a cooperative contacting relationship with the material to effect shearing and removing of the predetermined portion of the travelling material.

4,597,522

WIRE BONDING METHOD AND DEVICE

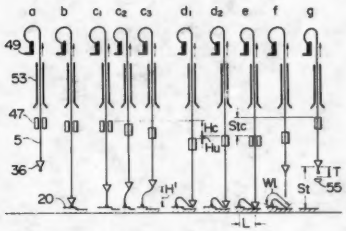
Hiroaki Kobayashi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 17, 1984, Ser. No. 661,739

Claims priority, application Japan, Dec. 26, 1983, 58-244120; May 9, 1984, 59-92025

Int. Cl.⁴ B23K *31/02*

U.S. Cl. 228—179 **16 Claims**



1. A wire bonding method of the type in which a bonding wire is supplied from a wire spool, and a bonding tool for holding the bonding wire at a portion adjacent to its leading end and a wire clamp for clamping said bonding wire at a position between said wire spool and said bonding tool are used to bond said bonding wire to a first bonding position on a semiconductor pellet and a second bonding position on an external terminal, thereby electrically interconnecting between said semiconductor pellet and said external terminal,

said method comprising the steps of:

forming a ball at the leading end of said bonding wire;

lowering said bonding tool so that said ball of said bonding wire is bonded at said first bonding position;

closing said wire clamp to clamp said bonding wire, lowering said wire clamp while moving said bonding tool to said second bonding position, and drawing said bonding wire of a predetermined length from said bonding tool, said predetermined length being determined according to the distance between the first bonding position and the second bonding position;

lowering said bonding tool while moving said bonding tool to said second bonding position, and opening said wire clamp so that said bonding wire is bonded to said second bonding position; and

closing said wire clamp to clamp said bonding wire, lifting said wire clamp to pull said bonding wire, and cutting said bonding wire at said second bonding position.

4. A wire bonding device comprising:

a bonding tool for holding a bonding wire;

a main arm having a first end securely joined to said bonding tool, a second end comprising a first cam follower means and a supporting point disposed between said first and second ends, said main arm being able to swing on said supporting point;

an auxiliary arm having a first end securely joined to said supporting point of said main arm and a second end comprising a second cam follower means, said auxiliary arm being able to swing on said supporting point, the distance between said first cam follower means and said supporting point being substantially equal to the distance between said second cam follower means and said supporting point;

cam means, mounted on a cam shaft, for causing linear displacement of said first cam follower means in response to variations in the angle of rotation of the cam shaft and wherein the distance between said first and second cam follower means remains constant; and

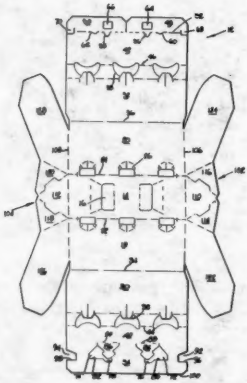
driving means for rotating said cam means about the axis of said cam shaft.

4,597,523

CARRIER LOCK

Richard L. Schuster, Monroe, La., assignor to Manville Service Corporation, Denver, Colo.

Filed Jun. 13, 1984, Ser. No. 620,307
Int. Cl.[4] B65D *65/06*
U.S. Cl. 229—40 6 Claims



1. A wrap-around style beverage package for a plurality of cans or bottles of beverage, the package surrounding the cans or bottles and having locking means on overlapping first and second margins of the package comprising:

the first margin having a primary male adjustable locking means comprising two oversized position tabs and two undersized position tabs;

the second margin having primary female adjustable locking means engaged by the primary male adjustable locking means of the first margin and comprising two oversized position slots positioned for engagement with the oversized position tabs on the first margin and two undersized position slots positioned for engagement with the undersized position tabs on the first margin;

the second margin having secondary punch-style male locking tabs;

the first margin having secondary punch-style female locking openings engaged by the secondary punch-style male locking tabs, the width of said male locking tabs being greater than the width of said openings;

the first margin having tertiary male locking tabs on each side of the primary male adjustable locking means;

the second margin having tertiary female openings on each side of the primary female adjustable locking means, said tertiary female openings being engaged by the tertiary male locking tabs, each of said tertiary female openings having a width equal to or greater than the width of the tertiary male locking tab engaged therein; and

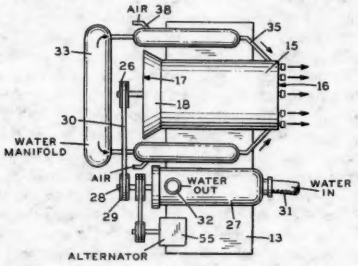
each tertiary female opening having an edge under which the associated tertiary male locking tab is engaged, each edge extending generally parallel to the free edge of the second margin and to edges of the two oversized position slots and the two undersized position slots of the primary female locking means which are positioned respectively for engagement with the two oversized position tabs and the two undersized position tabs of the primary locking means, with the spacing from the free edge of the second margin to the edges of the tertiary female openings being intermediate the spacing from the free edge of the second margin to the edges of the oversized position slots and the undersized position slots.

4,597,524

SNOW MAKING MACHINE

Stig L. Albertsson, P.O. Box 297, Manchester, Vt. 05254

Continuation of Ser. No. 630,346, Jul. 13, 1984, abandoned, which is a continuation of Ser. No. 360,610, Mar. 22, 1982, abandoned. This application Feb. 25, 1985, Ser. No. 705,042
Claims priority, application European Pat. Off., Mar. 12, 1983, 83102459.1
Int. Cl.[4] F25C *3/04*
U.S. Cl. 239—14 3 Claims



1. Snow making apparatus of the fan-augmented, air/water atomizing type, for use in conjunction with mountain site external supply systems for water and air under pressure, which comprises

(a) an open-ended shroud,

(b) a fan for directing a flow of air through said shroud,

(c) a plurality of air/water atomizing nozzles arranged circumferentially about said shroud and arranged to discharge atomized water and compressed air forwardly along with said flow of air,

(d) a water driven tubine driving said fan,

(e) means for connecting said inlet of said turbine to said external supply of water under pressure,

(f) water delivery means for supplying water to said atomizing nozzles and including said turbine in series, whereby at least a substantial portion of the water delivered to said nozzles is first passed through and serves to drive said turbine and whereby the entire volume of exhaust water from said turbine is directed to snow making nozzles,

(g) compressed air delivery means joining said water delivery means upstream of said atomizing nozzles and delivering the compressed air exclusively to said air/water atomizing nozzles, and

(h) means for varying the rate of flow of compressed air supplied by said air delivery means relative to the supply of water delivered by said water delivery means.

4,597,525

BARRIER-FREE WATER COOLER

Robert L. Cushman, Freeport; Arlan Koester, Rock City, and Michael Eveland, Freeport, all of Ill., assignors to King Seeley Thermos Co. (Halsey Taylor Div.), Prospect Heights, Ill.

Division of Ser. No. 457,729, Jan. 13, 1983, Pat. No. 4,520,960. This application Mar. 18, 1985, Ser. No. 712,727
Int. Cl.[4] E03B *9/20*
U.S. Cl. 239—28 31 Claims

1. A barrier-free drinking water fountain for attachment to the surface of a generally vertically extending wall, comprising:

an enclosure having a rear portion adapted to be secured in coplanar relationship to the wall surface, whereby said enclosure is entirely disposed and projects forwardly from said wall surface;

left and right sidewalls projecting forwardly from said rear portion and extending substantially the entire vertical dimension of said rear portion;

said sidewalls having a lowermost portion and an uppermost portion, the uppermost portion having a forwardly pro-

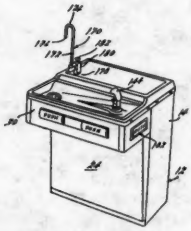
jecting portion which extends substantially farther from said wall surface in the forward direction than said lowermost portion;

a top member disposed upon and secured to said uppermost portion of said sidewalls;

said top member forming a generally horizontal and substantially rectangular upwardly facing countertop surface, said countertop surface being generally equal in the forward dimension to the forward dimension of said lowermost portion of said sidewalls;

said top member also forming a water basin having a drain therein, said basin being disposed farther from said wall surface in the forward direction than said countertop surface and being disposed above said forwardly projecting portion; and

a means disposed on said top member for dispensing water into said water basin.



4,597,526

PROCESS AND APPARATUS FOR THE SUPERFINE SPRAYING OF SUSPENSIONS

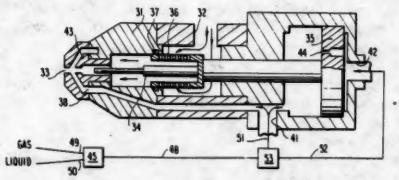
René Egli, Sins, and Hans-Rudolf Staub, Eggenwil, both of Switzerland, assignors to Lonza Ltd., Gampel, Switzerland

Continuation-in-part of Ser. No. 260,610, May 5, 1981, abandoned. This application Aug. 29, 1983, Ser. No. 527,405

Claims priority, application Switzerland, May 13, 1980, 3725/80; Jul. 6, 1983, 3700/83

Int. Cl.[4] B05B *15/02*

U.S. Cl. 239—123 **5 Claims**



1. Apparatus for the superfine spraying of dispersive systems, such as, suspensions, comprised of a spray head with a nozzle mouthpiece developed as a gas atomizer nozzle which is equipped with a pressurized gas feed, the nozzle mouthpiece having a nozzle opening, a die that can be pushed into and out of the nozzle opening which is disposed inside of the spray head, the die is part of a shaft, a sieve insert with a stripping arrangement, which is disposed between an inlet for the dispersed system and the nozzle opening, an apparatus for the saturation or oversaturation of the gas of the pressurized gas feed with a liquid, a chamber located in ther apparatus opposite of the nozzle, the non-die end of the shaft having a piston located in the chamber, there being two inlets for the pressurized gas feed in the apparatus, both inlets communicating with the chamber so as to each enter the camber on different sides of the piston, there being a pressurized gas guide from one of the inlets to the nozzle opening, and a capillary, having a diameter of 0.4 to 0.6 mm, disposed in the piston, whereby wetted pressurized gas flows into the nozzle opening through the pressurized gas guide, and during a pause in the spraying by way of the pressurized gas inlet, is positioned in the chamber on the side of the piston away from the nozzle through the capillary.

4,597,527

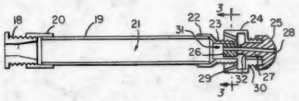
TOY WATER GUN WITH A MULTIPLICITY OF OPERATION MODES

Ned R. Sands, 2230 Holly Ave., Escondido, Calif. 92027

Filed Nov. 18, 1983, Ser. No. 553,037

Int. Cl.[4] B67D *5/42, 5/52*

U.S. Cl. 239—394 **5 Claims**



1. A toy water shooting gun comprising a longitudinal cylinder having a water retaining chamber and a water discharge end, a nozzle for discharging a stream of water connected to the water discharge end of said chamber, and a movable piston within said cylinder externally operated for loading and discharging water therefrom, the improvement comprising a rotatable cap having a plurality of apertures therethrough for discharging a water stream in one of several selectable different directions and valve means for selectively connecting one of said plurality of apertures to the cylinder discharge end for discharging a water stream through the selected single aperture, wherein said nozzle includes said rotatable cap carried thereby, said valve means including a channel passing through a first plug carried by said cylinder discharge end and wherein the valve means further comprises a second relatively rotatable plug carried by said nozzle cap positionable upon rotation of said cap to align said channel of said first plug with said selected aperture to discharge a stream of water from said gun upon actuation of said piston within said cylinder.

4,597,528

LAWN SPRINKLER

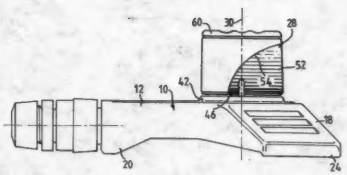
Joseph Caruana, Clwyd, Wales, assignor to Hozelock-ASL Limited, Aylesbury, England

Filed Oct. 10, 1984, Ser. No. 659,422

Claims priority, application United Kingdom, Oct. 13, 1983, 8327423; Nov. 21, 1983, 8331049

Int. Cl.[4] B05B *3/04, 3/08, 3/16*

U.S. Cl. 239—381 **5 Claims**



1. A lawn sprinkler comprising a base and a water dispersing member mounted for free rotation about a vertical axis, the water dispensing member having a first convexly curved part-cylindrical surface with a center of curvature formed by a first horizontal axis, and a second concavely curved part-cylindrical surface with a center of curvature formed by a second horizontal axis orthogonal to the first horizontal axis, the base

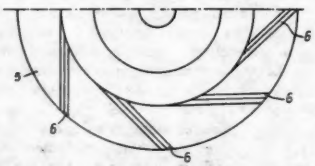
having a nozzle which is arranged to direct a water jet upwardly, in a direction parallel to said axis of rotation of the dispersing member, onto the first, convexly curved surface of the dispersing member, the latter surface being arranged to distribute the water from the jet onto the second concavely curved surface of the dispersing member which is configured and positioned such that the water impinging thereon is dispersed from the concavely curved surface through a substantial range of angles of elevation, the reaction to the force of water impinging on the dispersing member being arranged to cause rotation of the dispersing member about said axis, so that the water flung off the dispersing member is distributed through 360° about said axis of rotation.

4,597,529

SELF-REGULATING SPRAY METHODS AND APPARATUS

Jean-Louis Merry, Verneuil en Halatte, France, assignor to Charbonnages de France, Paris, France

Filed Jul. 9, 1984, Ser. No. 628,851
Claims priority, application France, Jul. 8, 1983, 83 11425
Int. Cl.⁴ B05B *7/06*
U.S. Cl. 239—430 **14 Claims**



1. A self-regulating nozzle comprising:

(a) a chamber having input means for delivery into said chamber of a product to be sprayed along a plurality of first directions and further having an output opening for exit of said product;

(b) a moveable component for selectively varying the cross-sectional area of said output opening in response to pressure developed in the interior of said chamber, said moveable component having a hollow body for receipt of a driving fluid and having at least one orifice for delivery of said driving fluid into said chamber along a plurality of second directions which intersect said first direction to facilitate mixing of said product and said driving fluid; and

(c) mechanical means for exerting a counter-force on said moveable component to at least partially overcome the force exerted by said pressure developed in the interior of said chamber to therby maintain the pressure drop through said output opening substantially constant.

4,597,530

FLUID DIFFUSER

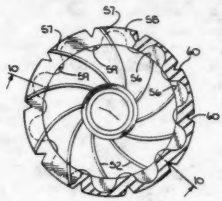
Paul R. Goudy, Jr., Shorewood; William P. Doolittle, Slinger; Thomas E. Jenkins, Glendale; Bernard J. Beemster, Mequon; William N. Roos, Colgate, and Patrick V. Collins, Brown Deer, all of Wis., assignors to Autotrol Corporation, Milwaukee, Wis.

Filed Sep. 28, 1984, Ser. No. 655,890
Int. Cl.⁴ B05B *1/32*
U.S. Cl. 239—452 **12 Claims**

1. A fluid diffuser, comprising:

a rigid outer disc having a central fluid opening and a scalloped perimeter defined by alternating crests and valleys; and

a flexible diaphragm including a flat, uninterrupted portion that overlaps one face of said disc and a rim portion that receives the crests of said scalloped perimeter, said rim portion overlying less than the entire scalloped perimeter



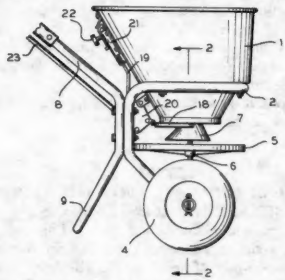
so that fluid openings are provided between the rim portion and said valleys.

4,597,531

MATERIAL SPREADER

Jay R. Kise, Marysville, Ohio, assignor to The O. M. Scott & Sons Company, Marysville, Ohio

Filed Sep. 7, 1984, Ser. No. 648,660
Int. Cl.⁴ A01C *17/00*
U.S. Cl. 239—650 **12 Claims**



1. In a spreader for particulate material having means for discharging said particulate material downwardly from said spreader and rotatable means in association with said discharge means for broadcasting said discharged material in a generally radial path, the improvement comprising

a conically-shaped deflector axially mounted between said discharge means and said broadcast means with its wider dimension facing said broadcast means, the bottom edge of said deflector having a radius which gradually varies from a given value to a larger value, said deflector being rotatably adjustable about the axis thereof to one of said radii but remaining stationary during operation of the spreader,

said deflector and discharge means being aligned so that particulate material is discharged onto the outer surface of said deflector,

whereby upon discharge, particulate material is deflected onto a preselected portion of said broadcast means.

4,597,532

MATERIAL BREAKUP DEVICE FOR MANURE SPREADERS

Gilbert W. Linde, Oxford; Norman M. Stauffer, New Holland, and Warren H. Brackbill, Paradise, all of Pa., assignors to Sperry Corporation, New Holland, Pa.

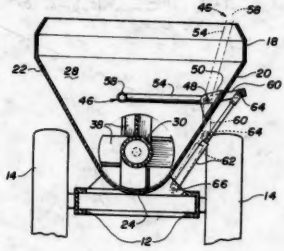
Filed Dec. 3, 1984, Ser. No. 677,652
Int. Cl.⁴ A01C *19/00*
U.S. Cl. 239—675 **3 Claims**

1. In a spreader having a tank for containing manure, said tank including a pair of sidewalls and a pair of endwalls, an auger rotatably mounted in said tank for moving manure toward an opening formed in said tank, said auger extending between said pair of endwalls, and an expeller disposed adja-

cent said opening to discharge manure from said tank, the improvement comprising:

material breakup means pivotally mounted on one of said pair of sidewalls and movable within said tank toward said auger to break up manure in said tank that has formed into a bridge above said auger;

said material breakup means including a plurality of legs each pivoted to said one sidewall and a bar connected



between said plurality of legs, said bar being disposed substantially parallel to the axis of said auger; and

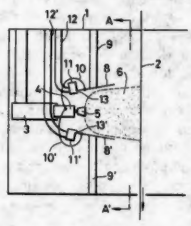
a lever fixed to one of said plurality of legs and extending through said one sidewall, and a hydraulic cylinder connected at one end to said lever so that extension and contraction of said hydraulic cylinder causes said material breakup means to move between upper and lower positions within said tank.

4,597,533

ELECTROSTATIC SPRAYING APPARATUS

Hiroshi Shirai, and Tsuneyasu Matsuhisa, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 7, 1983, Ser. No. 502,061
Claims priority, application Japan, Jun. 10, 1982, 57-86627[U]
Int. Cl.⁴ B05B *5/04*
U.S. Cl. 239—701 **5 Claims**



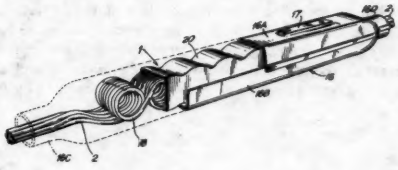
1. A rotary electrostatic spraying apparatus, comprising: means for spraying charged particles of a coating material onto a traveling substrate, and including electrode plates positioned along the path of the flying particles for providing an electric field repelling said particles, and means for forming an air stream in front of each of said electrode plates in a transverse direction thereto, said substrate passing in a direction transverse to the positioning of said electrode plates, said substrate having a width greater than the distance between said electode plates.

4,597,534

POWDER SPRAY WITH THE ABILITY TO CHARGE ELECTROSTATICALLY

Jan Ruud, Fregattgränd 1, 440 74 Hjälteby, Sweden

PCT No. PCT/SE82/00129, § 371 Date Dec. 23, 1982, § 102(e) Date Dec. 23, 1982, PCT Pub. No. WO82/03573, PCT Pub. Date Oct. 28, 1982
Continuation of Ser. No. 456,026, Dec. 23, 1982, abandoned.
This PCT application Apr. 22, 1982, Ser. No. 790,635
Claims priority, application Sweden, Apr. 24, 1981, 8102606
Int. Cl.⁴ B05B *5/02*
U.S. Cl. 239—704 **8 Claims**



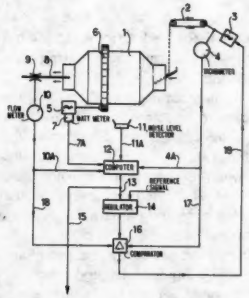
1. A sprayer comprising: a plurality of elongated tubular ducts of an electrically non-conducting material enclosed by a layer of an electrically conducting material over part of their length, inlet means for conducting powder into said ducts, outlet means for conducting powder out of said ducts and nozzle means associated with said outlet means for receiving powder from said outlet means and directing said powder toward a surface to be coated, means connected to said layer for electrically charging powder material when passing through said ducts by contact with internal walls of the ducts, said ducts being arranged essentially parallel to each other, with each duct having a longitudinal axis extending essentially in a plane containing the flow direction of the powder and having a plurality of loops in said plane with adjacent loops in each duct being wound in opposite directions so the transportation direction for powder passing through the duct is reversed in adjacent successive loops.

4,597,535

METHOD AND APPARATUS FOR REGULATING THE OPERATION OF A CRUSHER

Daniel Fontanille, Rambouillet, France, assignor to Stein Industrie, Velizy-Villacoublay, France

Filed Jun. 16, 1982, Ser. No. 388,816
Claims priority, application France, May 3, 1982, 82 07631
Int. Cl.⁴ B02C *25/00*
U.S. Cl. 241—30 **2 Claims**



1. A method of regulating the operation of a material crusher energized by electrical power having an amount of material fed thereto for crushing and withdrawal therefrom at given

material supply and removal flow rates by powering said crusher, said crusher emitting noise while under powered operation, said method comprising the steps of:

comparing the material supply and removal flow rates of incoming and withdrawn material,

detecting said noise emitted by the crusher, said electrical power absorbed thereby and the material supply and removal flow rates, and

providing a rapid, rough regulation of said amount of material fed into said crusher by controlling the flow rate of the material fed into the crusher according to a comparison between the flow rates of the incoming and withdranw material, and

providing a fine, slow regulation of the material fed into the crusher by regulating the flow rate of the material fed into the crusher according to the comparison between the flow rates of the incoming and withdrawn material, and according to the emitted noise and power consumed by the crusher.

4,597,536

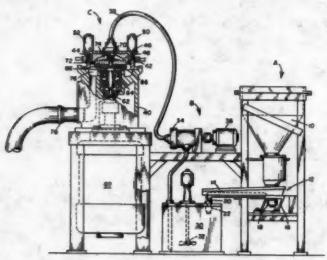
COMMINUTING APPARATUS WITH IMPROVED ROTOR AND STATOR COMPOSITION

James J. Tloczynski, Parma, Ohio; Melvin Budzol, Schaumburg, Ill.; Clifford J. Ahola, Cleveland, Ohio, and James C. Rine, Lake City, Fla., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 29, 1981, Ser. No. 316,214

Int. Cl.[4] B02C *7/12*

U.S. Cl. 241—62 **5 Claims**



1. A colloid mill for pellets to particles having a median diameter of about 50 microns comminuting vulcanized rubber, the mill comprising:

a stator having a generally peripheral abrasive surface;

a rotor disposed to be rotated relative to the stator, the rotor having a generally peripheral abrasive surface disposed adjacent the stator peripheral abrasive surface to define a grinding zone therebetween, the rotor having at least one generally radially extending recess extending into the grinding zone providing a path for pellets of the material to be comminuted;

the stator and rotor, including the peripheral abrasive surfaces thereof, being constructed of a porous matrix of vitreously bonded abrasive grits with about 22% glass by weight, the grits having a size in the range of 36 to 80 mesh and which define a median pore size of about 50 microns; and,

a means for supplying a slurry of vulcanized rubber pellets and liquid to the grinding zone.

4,597,537

VERTICAL MILL

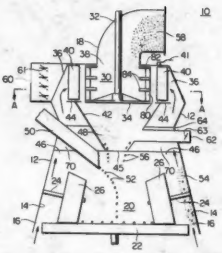
Takaaki Misaka, Tokyo; Takeshi Furukawa, [illegible]saki; Eiichi Onuma; Hiroshi Obana, both of Narashino; Kyosuke Fukuyama, Ichikawa; Toshiyuki Tanaka, Ashiya; Hiroyuki Murata, and Katuhiko Shimojima, both of Kobe, all of Japan, assignors to Onoda Cement Company, Ltd., Onoda and Kobe Steel, Ltd., Kobe, both of, Japan

Filed Sep. 6, 1983, Ser. No. 529,687

Claims priority, application Japan, Sep. 14, 1982, 57-158857; Dec. 3, 1982, 57-211251; Dec. 3, 1982, 57-211252

Int. Cl.[4] B02C *15/00, 23/32*

U.S. Cl. 241—79.1 **3 Claims**



1. A vertical mill for material such as cement raw materials, clinker, coal, or the like, comprising: a casing; a grinder portion, positioned in a lower part of said casing having a rotary table horizontally rotatable, and a plurality of rollers adapted to roll on an upper surface of said rotary table and to grind said material; and a separator means positioned above said grinder portion having an extraction conduit for fine particles mounted on the top center of said casing, a rotary disk being horizontally rotatable which is mounted to the lower end of a rotary vertical shaft extending perpendicularly through said extraction conduit, a plurality of guide vanes disposed vertically around said rotary disk, an inlet formed to surround said guide vanes, a plurality of adjusting plates vertically mounted on said rotary disk, a separator chamber formed inside of said rotary disk and of said guide vanes and of the top surface of said casing, at least one dashboard horizontally mounted to said adjusting plates so that said dashboard may divide said separator chamber into a plurality of separator chambers, and a funnel-type inner cone whose broader upper end is positioned at the underside of said inlet and whose narrower lower end is positioned above the center of said rotary table; and a plurality of straightening vanes each with lower and upper portions mounted between said casing and said inner cone; and characterized in that the diameter of said casing becomes gradually smaller from the lower end level of said separator means towards the upper end level of said separator means and the lower portion of each of said straightening vanes being vertically disposed and the upper portion of each of said straightening vanes being inclined relative to said lower portions of the straightening vanes at an angle measured from the upper end of said lower portions, between said casing and said inner cone.

4,597,538

ASPHALT COMMINUTING APPARATUS

Roland A. Getz, P.O. Box 6249, Phoenix, Ariz. 85005

Filed May 16, 1984, Ser. No. 610,776

Int. Cl.[4] B02C *13/28*

U.S. Cl. 241—86.1 **24 Claims**

1. Solids comminuting apparatus comprising:

a housing;

a drum mounted in said housing for rotation about a horizontal axis, said drum having at least two axially extending slots in the periphery thereof, said slots spaced circumferentially around the drum from each other;

a hammer assembly mounted in each of said axially extending slots, each of said hammer assemblies comprising;

an elongated hammer bar mounted in the respective axially extending slot and including:

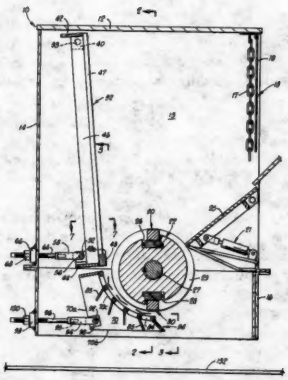
a radially inner portion having a tapered side extending substantially parallel to the axis of rotation of said drum; and

a radially outer portion having a plurality of spaced, trapezoidally-shaped, undercut, dove-tailed, hammer-receiving slots formed therein and spaced longitudinally from each other over the length of the hammer bar;

at least one wedge bar of trapezoidal cross-section positioned in the respective axially extending slot adjacent said hammer bar and including a tapered face bearing against and mating with the tapered side of the radially inner portion of said hammer bar;

means adjustably positioned between said wedge bar and a side of the respective axially extending slot in the periphery of said drum bearing against a radially extending side of the respective axially extending slot for forcing said wedge bar and said hammer bar toward the opposite side of said axially extending slot;

a plurality of axially aligned hammers datachably mounted on said hammer bar, each of said hammers including:



a radially inner trapezoidally-shaped root portion wedged into one of said dove-tailed hammer-receiving slots; and

a radially outer impact and grinding portion;

means detachably locking each individual one of said hammers in its respective hammer-receiving slot on said hammer bar whereby each of said hammers can be individually removed from, and replaced on, said hammer bar, said means detachably locking said hammers comprising:

a hammer locking bolt extending through the respective hammer and a peripheral portion of said drum in a direction substantially normal to a radius of the drum extended through the respective axially extending slot of the respective hammer bar; and

a locking nut threaded on said hammer locking bolt;

means in said housing for feeding a material to be comminuted into the path of said hammers as said drum and its peripherally mounted hammer assemblies are rotated;

an upper grate assembly pivotally mounted in said housing and having

a movable lower end portion, and

a plurality of generally vertically extending screening plates;

adjusting means extending into said housing from the outer side thereof and having an inner end connected to the movable lower end portion of said upper grate assembly for moving the lower end portion of said upper grate assembly toward and away from said drum; and

a lower grate assembly of arcuate configuration pivotally mounted in said housing below said upper grate assembly and adjacent a lower portion of said drum, said lower grate assembly including:

an upper end portion pivotally supported in said housing for pivotation about a horizontal axis;

a lower end portion;

a plurality of parallel spaced plates extending from the upper end portion of the lower grate assembly to the lower end portion of the lower grate assembly and each lying in a plane extending substantially normal to the axis of rotation of the drum; and

a plurality of spaced, parallel transverse breaker bars extending across and interconnecting said plates and extending parallel to the axis of rotation of said drum; and

means for adjustably moving the lower end portion of said lower grate assembly toward and away from said drum.

4,597,539

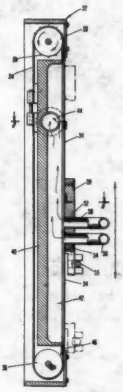
APPARATUS FOR CUTTING AND ASPIRATING FILAMENTARY MATERIAL TO WASTE

Peter Conrad, Charlotte, N.C., assignor to Celanese Corporation, New York, N.Y.

Filed Jul. 8, 1985, Ser. No. 752,984

Int. Cl.[4] B65H *54/02, 67/04*

U.S. Cl. 242—18 PW **12 Claims**



1. In an apparatus for winding continuously approaching filamentary material comprising a rotary spindle for supporting a tube upon which filamentary material is wound, cutter means for cutting said filamentary material when said tube is full, aspirating means for sucking-in the approaching filamentary material after the filamentary material has been cut, means for moving said aspirating means downwardly to displace the filamentary material toward said spindle and toward an empty tube mounted on said spindle, and conducting means for conducting the filamentary material from said aspirating means to waste, the improvement wherein said conducting means comprises:

means defining a chamber having a vertical opening at one side,

a belt mounted for travel along said opening,

duct means communicating with said chamber for transmitting a negative pressure therein to draw said belt against said opening,

a member connected to said belt and including passage means therethrough which communicates continuously with said chamber as said member travels along said opening,

tube means communicating with said passage means and with said aspirating means for conducting the filamentary material from said aspirating means to said chamber for discharge to waste through said duct means, and

means for moving said member and said aspirating means downwardly together.

4,597,540

BOBBIN SUPPLYING DEVICE IN AUTOMATIC WINDER

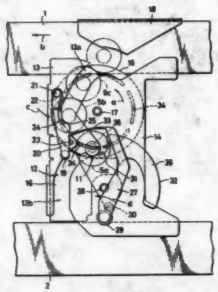
Masaharu Kiriake, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Japan

Filed Oct. 3, 1983, Ser. No. 538,664

Claims priority, application Japan, Oct. 13, 1982, 57-180466

Int. Cl.[4] B65H *54/20, 67/06*

U.S. Cl. 242—35.5 A **9 Claims**



1. A device for supplying a plurality of bobbins in sequence to a winder, each one of said bobbins being positioned on a bobbin carrier, said device comprising:

first means for securing a first one of said bobbins and carriers in a standby position,

second means for securing a second one of said bobbins and carriers in a yarn running position,

transfer means for transferring each one of said bobbins and carriers in sequence from said standby position to said yarn running position,

delivery means for delivering a yarn end of said bobbin to said winder when said bobbin and carrier is in said yarn running position,

said first means operating to maintain said first bobbin and carrier in spaced relationship with said second bobbin and carrier,

whereby interference between the outer surfaces of said first and second bobbins is reduced or eliminated;

wherein said first means comprises:

a stopper,

said stopper being pivotable between a first position and a second position,

wherein said first bobbin and carrier is prevented from movement from said standby position when said stopper is in said first position and said first bobbin and carrier is released for movement to said yarn running position when said stopper is in said second position.

4,597,541

APPARATUS FOR UNWINDING PRINTED PRODUCTS WOUND UP IN AN IMBRICATED FORMATION

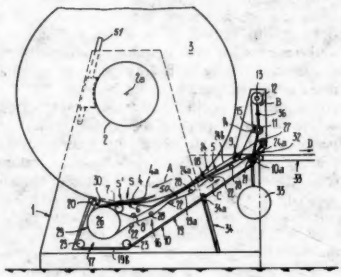
Willy Leu, Pfäffikon, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Oct. 29, 1984, Ser. No. 665,663

Claims priority, application Switzerland, Nov. 7, 1983, 5985/83

Int. Cl.[4] B65H *29/16, 20/28;* **B65B** *63/00*

U.S. Cl. 242—55 **22 Claims**



1. An apparatus for unwinding substantially flat products, such as printed products and the like, that have been previously wound up in imbricated formation on a winding mandrel conjointly with a winding strap in the form of a wound package, comprising:

support means for freely rotatably journalling one winding mandrel at a time;

a rotatably journalled and drivable winding strap take-up roll for winding up said winding strap unwound from said wound package;

a pivotably journalled continuous conveyor having an effectively conveying run and coacting with said winding mandrel and the products wound thereon for transporting said unwound products away as an imbricated formation;

said winding strap having a side which previously faced said winding mandrel before unwinding said wound package;

said continuous conveyor being arranged such that said effectively conveying run extends completely on said side of said winding strap;

said unwinding imbricated formation having a side which previously faced said winding mandrel within said wound package; and

said effectively conveying run operatively coacting with said side of the unwinding imbricated formation.

4,597,542

DEVICE FOR SIMULTANEOUS WINDING OF SEVERAL TAPES ON INDIVIDUAL REELS

Robert J. LeFrank, North Plainfield, N.J., assignor to Ruesch Machine Company, Springfield, N.J.

Filed Jul. 19, 1985, Ser. No. 756,736

Int. Cl.[4] B65H *19/22*

U.S. Cl. 242—64 **12 Claims**

1. A winder for winding several tapes simultaneously comprising:

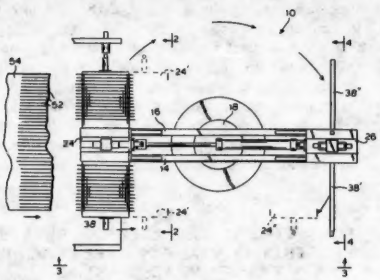
a vertical post;

horizonal support means rotatably mounted on said post for rotation around a vertical axis; and

first and second spindle holding means mounted on said support means for holding reels each including a vertical arm supported by said horizontal support means and a plurality of spindles mounted on said arm rotatable around horizontal axes for holding reels;

whereby one of said first and second spindle holding means may be positioned at a winding station for winding tapes

on reels while the other spindle holding means may be positioned at an unloading station for replacing full reels



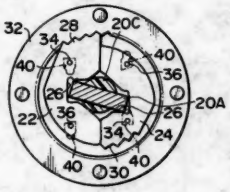
with empty reels, after which the positions of said first and second holding means may be reversed by rotating said horizontal support means.

4,597,543

LOCKING MECHANISM ADAPTED FOR USE IN WEBBING RETRACTOR

Shinji Mori, and Keiichi Tamura, both of Aichi, Japan, assignors to Kabushiki Kaisha Toka-Rika-Denki-Seisakusho, Aichi, Japan

Filed Jan. 16, 1984, Ser. No. 570,909
Claims priority, application Japan, Jan. 27, 1983, 58-10496
Int. Cl.[4] B60R *22/38;* B65H *75/48*
U.S. Cl. 242—107.4 B **14 Claims**



1. A locking mechanism for a webbing retractor used in a seatbelt system protecting an occupant in an emergency situation of a vehicle, comprising:

(a) a frame mounted on a vehicle body;

(b) a takeup shaft rotatably supported to the frame and winding an occupant-restraining webbing;

(c) lock means disposed between the frame and the takeup shaft and including an internal gear wheel fixed to the frame and a plurality of lock plates supported to the takeup shaft and rotated together with the takeup shaft, said lock plates having teeth portions and being guided by a locking wheel rotated by a predetermined biasing force in accordance with the rotation of the takeup shaft, whereby the lock plates are capable of separation from and approach to the internal gear wheel, the lock plates being separated from the gear wheel in an ordinary running situation of the vehicle, and in the emergency situation of the vehicle the teeth portions of the lock plates coming into mesh with the internal gear wheel to stop rotation of the takeup shaft, the teeth portion of one of the lock plates being disposed nearer to the internal gear wheel than the teeth portion of the other lock plate to be caused to come into mesh with the internal gear wheel earlier than the teeth portion of the other lock plate, the teeth portion of the said other lock plate coming into mesh with the internal gear by deformation of the takeup shaft when a large tension acts upon the webbing in an emergency situation of the vehicle; and

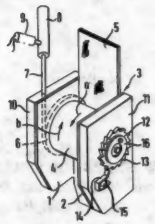
(d) acceration-responsive means causing the lock plates to come into mesh with the internal gear wheel in the emergency situation of the vehicle.

4,597,544

SAFETY BELT RETRACTOR

Artur Fohl, Schorndorf, Fed. Rep. of Germany, assignor to TRW Repa GmbH, Alfdorf, Fed. Rep. of Germany

Filed Jan. 15, 1985, Ser. No. 691,693
Int. Cl.[4] B60R *22/38, 22/40, 22/46*
U.S. Cl. 242—107.4 B **8 Claims**



1. A safety belt retractor for use in a vehicle, said safety belt retractor comprising a frame, a belt spool rotatably supported on said frame and spring biased in a rewind direction, an excessive deceleration sensitive belt slack retightening mechanism adapted to be positively coupled to said belt spool to drive said belt spool in a retightening direction upon occurrence of excessive deceleration of said vehicle, blocking means for blocking said belt spool from rotation relative to said frame, and control means for controlling said blocking means in response to acceleration of belt webbing withdrawal from said belt spool, said control means comprising a control disc supported for limited relative rotation with respect to said belt spool, said limited relative rotation controlling a spool blocking pawl, and an inertial disc coupled to said control disc for rotation therewith by a coupling means which permits rotation of said inertial disc with respect to said control disc only upon the exceeding of a predetermined retightening rotational acceleration of said belt spool and said control disc.

4,597,545

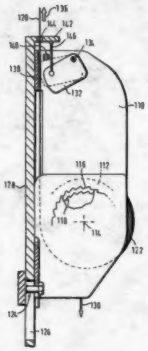
SEAT BELT TENSIONING SYSTEM

Wilfried Burghardt, Altomuenster, Fed. Rep. of Germany, assignor to Britax-Kolb GmbH & Co., Dachau, Fed. Rep. of Germany

Filed May 9, 1985, Ser. No. 732,457
Claims priority, application Fed. Rep. of Germany, May 14, 1984, 3417863; May 14, 1984, 3417877
Int. Cl.[4] B60R *22/42, 22/46*
U.S. Cl. 242—107.2 **13 Claims**

1. A seat belt tensioning system for a motor vehicle comprising a locking retractor for a seat belt, means defining a protraction direction for the belt and a pre-tensioning device for pre-tensioning the seat belt, the pre-tensioning device comprising mounting means for mounting the retractor on a fixed mounting member so as to permit movement of the retractor in

a direction opposite to the protraction direction of the belt, and traction means connected to the retractor and adapted to move



the retractor in said direction and simultaneously effect locking of the retractor.

4,597,546

WEBBING RETRACTOR

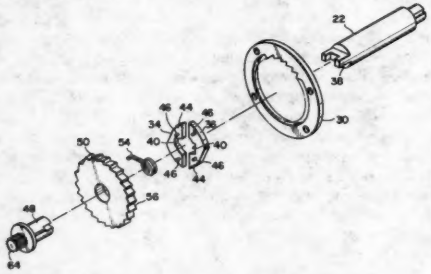
Toshimasa Yamamoto, and Takayuki Ando, both of Niwa, Japan, assignors to Kabushiki Kaisha Takai-Rika-Denki-Seisakusho, Aichi, Japan

Continuation of Ser. No. 734,763, May 15, 1985, abandoned, which is a continuation of Ser. No. 549,689, Nov. 7, 1983, abandoned. This application Nov. 29, 1985, Ser. No. 802,624

Claims priority, application Japan, Nov. 29, 1982, 57-180495[U]; Sep. 26, 1983, 58-148315[U]

Int. Cl.[4] A62B *35/02*

U.S. Cl. 242—107.4 A **7 Claims**



1. A webbing retractor for use in a seatbelt system for protecting an occupant in a vehicular emergency situation, comprising

(a) a rotatable takeup shaft for winding a webbing thereon;

(b) a locking wheel connected to said shaft to rotate in a lagging relationship with said shaft above a certain angular acceleration, wherein said locking wheel is circumscribed by a plurality of ratchet teeth;

(c) a ratchet ring member having a plurality of ratchet teeth around its inner diameter;

(d) at least one locking plate connected to said locking wheel, wherein said plate has a plurality of rachet teeth which are meshable with the teeth of the ratchet ring member when said locking wheel rotates in lagging relationship with said shaft;

(e) an acceleration sensor having means for stopping the rotation of the locking wheel relative to the takeup shaft in a vehicular emergency situation, and

(f) a control means including a pivotable arm having first and second ends, wherein said first end is engageable with and disengageable from the ratchet teeth of the locking wheel, and an arm-pivoting means actuated by said takeup shaft for pivoting the first end of the arm into ratchet-locking engagement with the teeth of the locking wheel when a predetermined amount of webbing is unwound from the takeup shaft so that said web is prevented from unwinding but may be wound upon takeup shaft, and for disengaging said first end of said arm from said ratchet teeth when a predetermined amount of webbing is wound back onto said takeup shaft, so that said web may be wound and unwound from said takeup shaft.

4,597,547

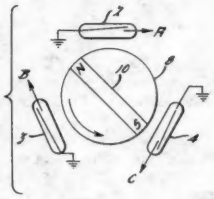
LOGIC CIRCUIT FOR DETECTING REVERSE ROTATION OF A TAKE-UP REEL IN A TAPE TRANSPORT MECHANISM

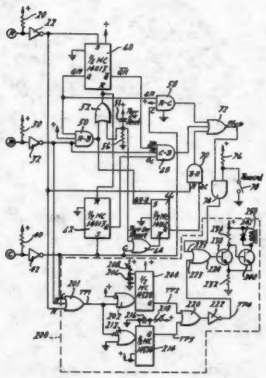
Gerald W. Tarpley, Jr., and Anne M. Bardon, both of Romulus, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 3, 1985, Ser. No. 719,774

Int. Cl.[4] G11B *15/48, 15/093;* B65H *59/38*

U.S. Cl. 242—191 **8 Claims**





1. In a tape recorder-player of the type wherein the tape is fed by means of a tape drive from a supply reel to a take-up reel rotating in a predetermined direction, an automatic system for detecting reverse rotation of said take-up reel comprising:

at least three switch elements actuated in a first sequence during each rotation of said take-up reel in said predetermined direction and in a second sequence during each rotation of said take-up reel in the reverse direction:

a logic means connected to said switch elements for monitoring the actuation of said switch elements and outputting a stop signal only when said second sequence of actuation of said switch elements is monitored; and

a stop circuit connected to said switch elements and to said logic means for disabling said tape drive when the frequency of rotation is detected as being below a predeter-

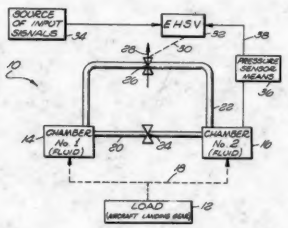
mined rate or said stop signal is output from said logic means.

4,597,548

SHOCK ABSORBING STRUTS FOR AIRCRAFT LANDING GEAR

Raymond A. Bergloff, Woodland Hills, and James T. Hollis, Fountain Valley, both of Calif., assignors to HR Textron Inc., Valencia, Calif.

Filed Jun. 17, 1983, Ser. No. 505,526
Int. Cl.[4] B64C *25/60*
U.S. Cl. 244—104 FP **4 Claims**



1. A shock absorbing airplane landing gear strut comprising:
a first fluid containing chamber;
a second fluid containing chamber;
a ground contacting member;
means for connecting said first and second chambers between the body of said airplane and said ground contacting member;
means for varying the volume of at least one of said chambers responsive to loads applied to said ground contacting member on landing or taxiing of said airplane;
first fluid flow path means connected between said chambers including a first orifice therein,
second fluid flow path means connected between said chambers in parallel with said first path and including a second orifice therein;
means for varying the area of at least one said orifices including a spool valve normally blocking said at least one orifice, responsive to the magnitude of said load exceeding a predetermined threshold;
means for sensing the pressure in one of said chambers; and
means connected to said pressure sensing means for producing a signal responsive to said load exceeding said threshold for moving said spool valve to open said orifice, the area of the other of said orifices being independently varied responsive to loads applied to said strut.

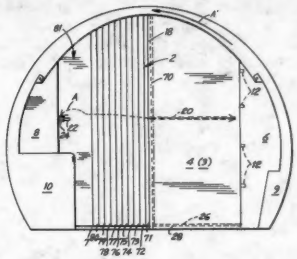
4,597,549

AIRCRAFT MID-CABIN DIVIDER

James M. Ryan, New York, N.Y., assignor to Falcon Jet Corporation, Teterboro, N.J.

Filed Sep. 28, 1984, Ser. No. 655,521
Int. Cl.[4] B64C *1/14*; B64D *11/00*
U.S. Cl. 244—118.5 **2 Claims**

1. An aircraft cabin divider, comprising: a pair of bulkheads aligned substantially parallel respective each other and spaced a distance apart so as to form both a hollow therebetween and an entrance to said hollow; and a door, one end of which is fixed about the entrance to said hollow so as not to block access thereto, said door comprising a series of panels pivotally connected one to another by joining means; whereby the end of said door opposite said one end may pass through said entrance and within said hollow while drawing therebehind the substantial remainder of said door thereby substantially concealing said door within said pair of bulkheads and wherein said door may thereafter be withdrawn from said hollow, said



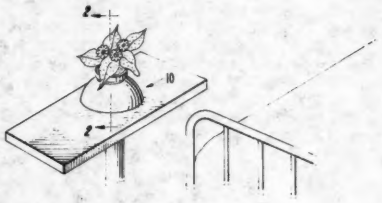
panels passing through said entrance upon exiting in the opposite order from which they entered.

4,597,550

POTTED PLANT DISPLAY STAND

Quay D. Rice, Sr., 2917 Hampshire Dr., Augusta, Ga. 30909

Filed May 28, 1985, Ser. No. 738,246
Int. Cl.[4] A47G *23/02*
U.S. Cl. 248—146 **2 Claims**



1. Apparatus for displaying a small potted plant which comprises:
a hollow, dome-like shell, circular in shape, constructed of thin, lightweight material, preferably plastic, for supporting said apparatus on a horizontal surface; and
a cup-like circular recess in the side of said apparatus, said circular recess being slightly larger in circumference than the outer circumference of the pot being held, for holding said small potted plant at an inclined angle to the horizontal, for ease of viewing the contents of said apparatus by a bedridden observer and which said circular recess has a narrow overhanging lip across the top of said circular recess to frictionally hold said pot in place.

4,597,551

VACUUM WAND HOLDER

Mark Ciechanowski, Long Beach, and Robin C. Faraday, Irvine, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 8, 1985, Ser. No. 709,640
Int. Cl.[4] A47F *5/00*
U.S. Cl. 248—314 **8 Claims**

1. A surface-mounted apparatus for holding an elongated hand-held instrument when not in use, said instrument having a flexible tube-like extension attached to an inserted end, said apparatus comprising:
an elongated cylindrical shell having an upper end, a lower end, and a longitudinal slot extending from said upper end to near said lower end and smoothly tapered at its upper end, said slot of width sufficient to allow unconstrained passage of said tube-like extension and of width selected in joint consideration of the cross-sectional dimension of said instrument and said shell wall thickness and flexibility

such as to allow for the removal of said instrument from said holder by the forcible passage of said instrument causing elastic deformation of said slot by pulling the exposed end of said instrument towards said slot and pivoting said instrument about the point where the tube-like extension comes into contact with the bottom of said slot as the instrument is drawn outward, and said shell of

inner diameter sufficient to easily accommodate insertion therein of said inserted end of said instrument provided said instrument is rotated to align said tube-like extension to pass through said slot during insertion; and

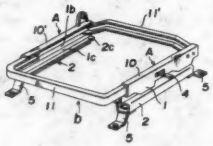
a mounting plate affixed to said shell for attaching said apparatus to a surface in an orientation favorable to the use of the force of gravity to cradle said instrument in said shell against random dislodging forces.

4,597,552

SEAT ADJUSTER

Takaichi Nishino, Akishima, Japan, assignor to Patent Service Corporation, Tokyo, Japan

Filed Mar. 13, 1984, Ser. No. 589,218
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—429 **6 Claims**



1. A seat adjuster for a vehicle seat comprising:

a pair of separated fixed rails each adapted to be fixedly secured to a floor of the vehicle;

a seat frame including an opposing pair of separated side frame members, each said side frame member including an integral movable rail, said movable rail having a flange;

slider means for coupling each said flange of said movable rail to a respective said fixed rail so as to permit slidable reciprocal movements of each said movable rail, and thus said seat frame, relative to said fixed rail, and

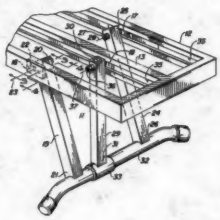
means defining integral projections formed on one of said pair of fixed and movable rails and opposingly extending towards the other one of said pair of fixed and movable rails so as to normally establish a clearance therewith, said means defining integral projections longitudinally spaced along one of said pair of fixed and movable rails for abutting against said opposing other one of said pair of fixed and movable rails in response to an excessive load being applied to the seat to distribute the applied load over said opposing other one of said pair of fixed and movable rails thereby preventing deformation of said movable rail and the flange thereof due to said applied loads.

4,597,553

TRACK-MOUNTED SUPPORT

Barre L. Rorabaugh, 8839 Production Ave., San Diego, Calif. 92121

Filed Jan. 25, 1985, Ser. No. 695,090
Int. Cl.[4] F16M *11/38*
U.S. Cl. 248—440 **10 Claims**



1. A track-mounted support for adjustably supporting a load adjacent a selected track location, said track-mounted support comprising:

first track means subjacent said load;

second track means subjacent said load, said second track means parallel said first track means;

third track means subjacent said load intermediate said first track means and said second track means, said third track means parallel said first track means and said second track means;

first stop means adjustably coupled to said third track means, for limiting sliding excursion along said third track means;

second stop means adjustably coupled to said third track means in spaced relationship with said first stop means, for limiting sliding excursion along said third track means;

first slider means slidingly captive to said first track means, said first slider means having anti-sliding fixation means;

second slider means slidingly captive to said second track means;

third slider means slidingly captive to said third track means intermediate said first and second stop means;

first leg means having an upper end and a lower end, said upper end of said first leg means pivotingly coupled to said first slider means by first pivot means along a first pivot axis;

second leg means having an upper end and a lower end, said upper end of said second leg means pivotingly coupled to said second slider means by second pivot means along a second pivot axis, said second leg means parallel said first leg means, said second pivot axis collinear said first pivot axis intermediate said first and second stop means.

third leg means having an upper end and a lower end, said upper end of said third leg means pivotingly coupled to said third slider means by third pivot means along a third pivot axis parallel said first pivot axis and said second pivot axis; and

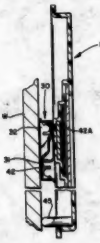
base rod means, said base rod rigidly orthogonally coupled to said lower end of said first leg means, said base rod rigidly orthogonally coupled to said lower end of said second leg means, said base rod pivotingly orthogonally coupled by fourth pivot means to said lower end of said third leg means along a fourth pivot axis parallel said first, second and third pivot axes.

4,597,554

WALL POSITIONING DEVICE

Houston F. James, 8350 Mobberly, Dallas, Tex. 75227

Filed Oct. 31, 1983, Ser. No. 547,044
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—542 3 Claims



1. In combination with a wall and an article to be mounted thereon, a matched set of a pair of fixture members in a wall positioning device, comprising:

a. a first fixture member having a continuous and relatively long horizontally extending angularly inclined peripherial flange on its lower side with an integrally formed downwardly projecting tab thereon of relatively short horizontal dimension located intermediate the length of said flange,

b. a second fixture member having a continuous relatively long horizontally extending angularly inclined peripherial flange on its upper side with an integrally formed upwardly facing pocket of relatively short horizontal dimension located intermediate the length of said flange,

c. means for installing said first fixture member to the back side of said article, and means for installing said second fixture member to the front side of said wall, whereby

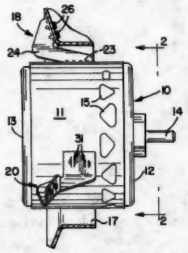
d. said relatively long horizontal flange of said first fixture member engages said long horizontal flange of said second fixture member simultaneously with the engagement of said tab with said pocket in a relatively tight fitting manner preventing any angularity in their engagement.

4,597,555

ELECTRIC MOTOR MOUNT

Peter R. Weihsmann, Sherwood, Ark., assignor to Franklin Electric Co., Inc., Bluffton, Ind.

Filed Sep. 2, 1983, Ser. No. 528,946
Int. Cl.[4] F16M *1/022*
U.S. Cl. 248—672 4 Claims



1. Apparatus comprising:

(1) an electric motor having a central axis and including a generally cylindrical part made of sheet metal;

(2) at least one sheet metal mounting lug for mounting said part on a housing said lug comprising a pad positioned on a surface of said part and an arm extending generally radially outwardly from said part and said pad and toward said housing; and

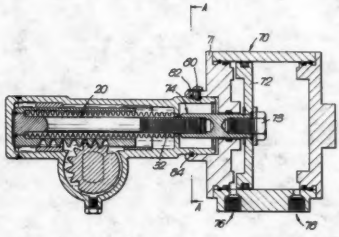
(3) at least one mechanical interlocking connection securing said pad to said part, each connection comprising at least one perforation in said pad, and deformed portions of said pad and said part at said perforation making an interlocking connection between said pad and said part, said pad having a curvature substantially conforming to said cylindrical part and being held flat against said part by said connection, and said pad and said part being subject to loads directed circumferentially of said part during operation of the motor, said connection being subjected to a load in the circumferential direction during operation of the motor, and said pad having a prestress therein in said circumferential direction, said part having an axis concentric with the central axis of said motor, said perforation and said deformed portions being formed by parallel slits and a bridge between said slits, and said slits and said bridges extending substantially circumferentially of the axis of said part.

4,597,556

ROTARY VALVE OPERATING MECHANISM

Michael J. Sandling, 9410 Dominion Cir., Cincinnati, Ohio 45243

Filed Mar. 28, 1985, Ser. No. 717,148
Claims priority, application United Kingdom, Mar. 28, 1984, 8407979
Int. Cl.[4] F16K *31/122, 31/54*
U.S. Cl. 251—58 12 Claims



1. In an operating mechanism for a rotary valve comprising a main housing having an access opening; a rotatable operating stem for said valve; a rigid elongate actuator member provided with a control portion projecting through said access opening; drive means whereby the operating stem is rotatable responsive to reciprocating movement of said actuator member; means for reciprocating said actuator member, such means cooperating with said control portion at a location exteriorly of said main housing; and a tubular flexible sealing bellows surrounding said actuator member, said bellows extending lengthwise of the actuator member and having one end thereof sealingly secured to said main housing about said access opening and the other end thereof sealingly secured relative to the actuator member; the improvement in that said drive means comprises a rack secured to the actuator member to be reciprocatable within the main housing; pinion teeth associated with said stem, the rack comprising a toothed member carrying rack teeth engaging said pinion teeth; the said toothed member is tubular with the actuator member extending therewithin to define therewith the walls of an annular space between the actuator member and the tubular member, said bellows being received in said annular space; and the said walls of said space are closely spaced from the internal and external surfaces of the convolutions of the bellows to provide support against deflection thereof.

4,597,557

HYDRAULICALLY-CONTROLLED NON-RETURN VALVE

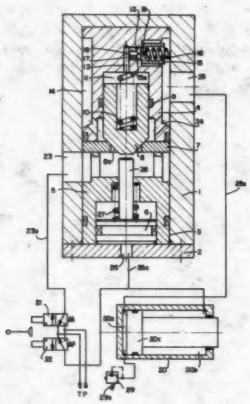
Karl Krieger; Jochem Hartleb, both of Wuppertal, and Werner Reinelt, Bochum, all of Fed. Rep. of Germany, assignors to Hermann Hemscheidt Maschinenfabrik GmbH & Co., Wuppertal, Fed. Rep. of Germany

Filed Mar. 1, 1985, Ser. No. 708,032

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1984, 3407878

Int. Cl.[4] F16K *31/124*; F15B *13/042*

U.S. Cl. 251—63.4 3 Claims



1. A hydraulically-controllable non-return valve for the hydraulic cylinders of walking mine-roof supports, comprising a valve housing, a valve case accommodated in said valve housing, a generally cylindrical valve-closing member arranged for sliding longitudinal displacement in said valve case, a valve seat in said valve housing, a tapered sealing face on said valve-closing member adapted to seat on said valve seat, a valve spring acting on said valve-closing member to load said valve-closing member to a closing position, an hydraulically-loadable control piston arranged for longitudinal displacement in said valve housing, a control stem on said control piston adapted to abut and thereby move said valve-closing member away from the valve seat, a seal between said valve-closing member and said valve case, a space for hydraulic fluid in said valve case on that side of the valve-closing member remote from the valve seat, a circulating duct in said valve housing, a stepped bore in said case, a branch bore in said case connecting said space for hydraulic fluid to the smaller end of said stepped bore, a cup-like flow-regulating member arranged for longitudinal movement in said stepped bore, a .tem fixed on said cup-like member and likewise arranged for movement in said stepped bore, a spring acting on said cup-like member, and a cruciform arrangement of through-flow ducts in said stem, said through-flow ducts in said stem comprising a transverse duct and a first longitudinal duct on one side thereof having through-flow cross-sections which are of substantially the same size as each other and a second longitudinal duct of smaller cross-section than said first longitudinal duct arranged on the opposite side of said transverse duct, said first longitudinal duct being in communication with said branch bore in said case and said second longitudinal duct being in communication with said circulating duct in said valve housing.

4,597,558

ELECTROMAGNETICALLY ACTUATABLE VALVE

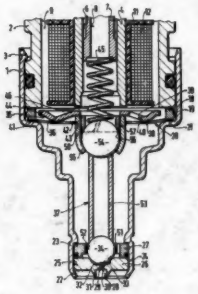
Udo Hafner, Lorch, and Heinrich Knapp, Leonberg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 15, 1985, Ser. No. 723,230

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1984, 3427526

Int. Cl.[4] F16K *31/06*

U.S. Cl. 251—129.15 3 Claims



1. An electromagnetically actuatable valve for fuel injection systems of internal combustion engines, comprising a valve housing; a core, a magnetic winding, and an armature in said valve housing with said armature coupled with a valve member, said armature is substantially flat and includes an annular guide ring, said valve member including a cylindrical elongation segment fixed to a spherical sealing segment arranged to cooperate with a fixed valve seat, a valve guide ring juxtaposed said valve member and supported in said valve housing, said spherical sealing segment adapted to protrude into a guide opening of said guide ring and guided by said guide opening coaxially with said valve seat, said armature including a central aperture, a bearing tube retainer affixed to said armature to surround said central aperature, a guide diaphragm secured along its outer circumference between said housing and a spacer ring, said guide diaphragm including a central aperture that surrounds said bearing tube retainer and a mid-portion that forms an annular guide zone upon which said annular guide ring of said armature rests, said guide diaphragm forming a centering element for said bearing tube retainer and said armature, a spherical pivot segment pivotably supported in said bearing tube retainer remote from said spherical sealing segment with said spherical pivot segment firmly joined to said cylindrical elongation segment of said valve member.

4,597,559

DIAPHRAGM VALVE

Kenneth L. Kirk, Cranston, R.I., assignor to Amtrol Inc., West Warwick, R.I.

Filed Apr. 2, 1985, Ser. No. 719,065

Int. Cl.[4] F16K *7/16*

U.S. Cl. 251—144 11 Claims

1. Diaphragm valve for a container for pressurized gas, comprising:

(a) an elongated member body having an elongated central passageway, said elongated central passagway having a first end opening and a second end opening;

(b) a flexible diaphragm positioned in and sealingly affixed to the side of said elongated central passageway of elongated body member (a), thereby forming a first chamber and a second chamber in said elongated central passageway of elongated body member (a), said first chamber corresponding to said first end opening, said second chamber corresponding to said second end opening, and the plane

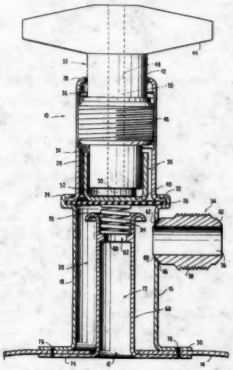
of diaphragm (b) being approximately perpendicular to the longitudinal axis of said elongated central passageway of elongated body member (a);

(c) a valve stem rotatably positioned in said first chamber in a manner whereby valve stem (c) can be moved toward or away from diaphragm (b), valve stem (c) having a first end and a second end, said first end of valve stem (c) protruding out of said first chamber, and means for rotating valve stem (c) being affixed on said first end of valve stem (c);

(d) a port located in the side of elongated member (a), said port communicating with said second chamber of elongated member (b);

(e) a short member having a central passageway, short member (e) having a first end and a second end, said first end of short member being affixed in port (d), and said second end of short member (d) being adapted to be connected to a source of pressurized gas;

(f) an elongated tubular member having a central passageway, elongated member (f) having a first end and a second end, elongated member (f) being positioned in said second chamber of elongated member (a), said second end of elongated member (f) being sealingly affixed to said second end opening of elongated member (a), the first end of elongated member (f) having been outwardly rolled over to form a valve seat, and said valve seat being positioned near but not in contact with diaphragm (b), wherein a rim



is positioned inside of said central passageway of elongated member (f), said rim having a central passageway, said rim being positioned near said first end of elongated member (f), and wherein there is a coil spring having a first end and a second end, said first end of said coil spring contacting diaphragm (b), the portion of said coil spring near said second end of said coil spring being positioned in the portion of said central passageway of elongated member (f) corresponding to said first end of elongated member (f), and said second end of said coil spring contacting said rim, said coil spring normally holding diaphragm (b) in the open position;

(g) the end of elongated member (a) corresponding to said second end port of elongated member (a) being adapted to be sealingly affixed to a container for compressed gas; and

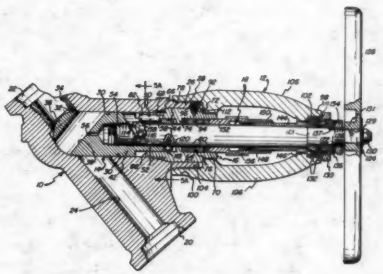
(h) a cup-shaped member having a central chamber which is open on one end and which has a flat bottom portion, cup-shaped member (h) being positioned in said first chamber of elongated member (a), said bottom portion of cup-shaped member (h) contacting, or being capable of contacting, diaphragm (b), said second end of valve stem (c) being positioned in said central chamber of cup-shaped member (h), said second end of valve stem (c) contacting, or being capable of contacting, said flat bottom portion of cup-shaped member (h), there being a route of communication from said second end of short member (e) through said central passageway of short member (e), said second chamber of elongated member (f) to said second end of elongated member (f), said diaphragm valve being capable of being moved into a closed position by rotating valve stem (c) inwardly whereby said flat bottom portion of cup-shaped member (h) sealingly presses diaphragm (b) against said valve seat of elongated member (f) and thereby said route of communication is sealingly interrupted.

4,597,560

HALF-TURN VALVE

Chester A. Siver, Suffield, Conn., assignor to Conval, Inc., Somers, Conn.

Filed Sep. 23, 1985, Ser. No. 779,074
Int. Cl.[4] F16K *25/00*
U.S. Cl. 251—163 **8 Claims**



1. In a valve assembly, the combination comprising:

(a) a valve body having a flow passage therethrough and a plug chamber therein, said plug chamber intersecting said flow passage and defining passage portions opening into said chamber through ports space thereabout, said chamber communicating with the exterior of said body through a bonnet opening extending along an axis displaced from that of said flow passage;

(b) a valve plug snugly seated in said plug chamber of said body and sealingly engaging at least one of said ports in a first position thereof to close said passage and prevent flow therethrough, said plug and chamber being dimensioned and configured to permit rotation of said plug about said axis from said first position to a second position and displacement thereof along said axis, said plug having a transverse bore therethrough dimensioned and configured to establish flow communication between said spaced ports in said second position, and having a threaded portion therewithin and a cylindrical collar portion outwardly of said threaded portion with both said threaded and collar portions being aligned on said axis, said collar portion having means defining an arcuate path extending circumferentially thereon with an axially extending abutment surface element at least at one end thereof and accessible for contact by a stop element moved along said arcuate path, and having an opening therethrough spaced circumferentially from said arcuate path, said plug having a stop element extending outwardly therefrom;

(c) a bonnet affixed within said bonnet opening of said valve body and having a bore of circular cross section aligned on said axis thereof, said collar portion of said plug being received within said bore and telescopically engaged by an inner end portion of said bonnet, said inner end portion having a groove formed therein and extending axially along said bore, and having means defining an arcuate path extending circumferentially thereon and providing a pair of abutment surface elements spaced to the opposite sides of said groove and accessible for alternative contact by a stop element moved along said arcuate path therebe-

tween, said stop element of said valve plug being disposed to move along said arcuate path and to alternatively engage one of said abutment surface elements of said bonnet upon relative rotation of said plug;

(d) a valve stem of circular cross section extending through said bore of said bonnet and having a threaded end portion engaging said threaded portion of said valve plug, said stem having a recess formed into its surface adjacent said end portion and having a stop element extending outwardly therefrom and disposed to move along said arcuate path of said plug collar portion and to engage said abutment surface element thereof upon relative rotation therebetween;

(e) means mounting said stem in a fixed axial position with respect to said valve body; and

(f) a locking element trapped within said opening of said plug collar portion between said bonnet and stem for radial movement and dimensioned and configured to alternatively engage within said groove of said bonnet inner end portion and within said recess of said stem; said groove, opening, recess, stop elements and abutment surfaces being so disposed with respect to one another that, in said first position of said plug, said locking element lies within said opening and groove to interengage said plug and bonnet and is held in place by a full diameter surface portion of said stem, said stop element of said stem is spaced from said abutment surface element of said plug collar portion, and said stop element of said plug lies adjacent one of said abutment surface elements of said bonnet inner end portion; and so that, in said second position of said plug, said locking element lies within said opening and said recess to interengage said plug and stem and is held in place by a full inside diameter portion of the wall of said bonnet inner end portion, said stop element of said stem lies adjacent said abutment surface element of said plug collar portion, and said stop element of said plug lies adjacent the other of said abutment surface elements of said bonnet end portion; whereby rotation of said stem in one direction from said first position thereof will cause said threaded end portion thereof to lift said plug from said one port of said valve body, will present said recess thereof to said locking element, and will cause said stop element thereof to bear upon said abutment surface element of said plug collar portion, whereby further rotation of said stem will cause said locking element to move within said opening of said plug collar portion to disengage from said groove of said bonnet and to engage within said recess of said stem to thereby couple said plug and stem for conjoint rotation, and will thereby enable rotation of said plug to said second position thereof to align said transverse bore with said ports of said valve body to establish flow communication between said passage portions, with said stop element of said plug abutting one of said abutment surface elements of said bonnet end portion to restrain further movement of said plug therebeyond, and whereby rotation of said stem in the opposite direction from said second position will enable return of said plug to said first position with said stop element thereof abutting the other of said bonnet portion surface elements to restrain further movement of said plug therebeyond.

4,597,561

LIFTING AND DEPOSITING DEVICE FOR PORTABLE CONTAINERS, E.G., CONTAINERS, SHELTERS, SUPERSTRUCTURE REPLACEMENTS PARTS OR THE LIKE

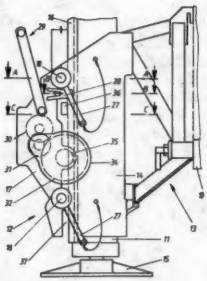
Jorg Wenzel, Freudenberg, Fed. Rep. of Germany, assignor to Haacon Hebetechnik GmbH, Freudenberg, Fed. Rep. of Germany

Filed Jul. 1, 1983, Ser. No. 510,189

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1982, 3224890

Int. Cl.[4] B66F 7/26

U.S. Cl. 254—45 11 Claims



1. Lifting and depositing device for a portable container, the device having a plurality of rack and pinion jacks, each of which comprises a jack housing adapted to be connected with the container, a support leg with a longitudinally extending rack, the jack housing being mounted for substantially vertical movement on the support leg, and accessory gearing mounted on the jack housing for engagement with the rack, characterized in that means are provided to movably mount the accessory gearing on the jack housing so that it can be moved between a first position in engagement with the rack and a second position wherein it is out of engagement with the rack, whereby the accessory gearing and rack can be conveniently cleaned when the accessory gearing is in said second position, the jack housing comprising a guide part surrounding the support leg, and a lifting and stop device is mounted on the guide part and has stop means engagable with the rack to lift the guide part slightly to reduce friction between the accessory gearing and the rack to facilitate movement of the accessory gearing away from the rack, the lifting and stop device having means to releasably lock the stop means to thus releasably lock the rack to the guide part of the jack housing when the accessory gearing is in said second position.

4,597,562

APPARATUS FOR LOWERING AND RAISING AN ARTICLE

Edward D. Joyce, Ringwood, N.J., assignor to F. W. Saybolt & Co. Inc., Kenilworth, N.J.

Filed Nov. 9, 1983, Ser. No. 550,266

Int. Cl.[4] B66D 1/36

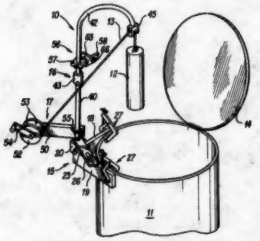
U.S. Cl. 254—334 6 Claims

1. An apparatus for lowering and raising an article suspended by a cord, comprising

a base including first and second base plates hingedly connected to each other, and positioning means connected to said first and second base plates to adjustably fix the relative position therebetween,

two holding means connected to said first and second base plates respectively and adapted to locate and fix the first and second base plates onto a desired structure, each holding means including a fixed member having a lower end connected to the base plate and an upper end extend-

ing upwardly from the lower end, a movable member rotationally connected at the middle portion thereof to the upper end of the fixed member and having upper and lower ends, said lower end being located near the base plate at a side opposite the fixed member relative to the base plate, and a tightening rod threadably engaging the upper end of the movable member and rotatably connected to the fixed member so that when the tightening rod is rotated in the tightening direction, the upper end of the movable member is moved upwardly to cause the lower end of the movable member to move toward the



base plate to thereby firmly grasp the structure between the movable member and the base plate,

a suspension rod rotatably connected to one of the first and second base plates, said suspension rod extending upwardly from the base and having a hanging device at an upper end thereof, and

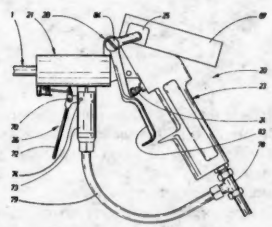
winding means connected to said suspension rod, said cord being operably connected to the winding means at one end and extending downwardly through the hanging device of the suspension rod so that the winding means, when actuated, lowers and raises the articles suspended by the cord.

4,597,563

TOOL HOLDER FOR THERMIC CUTTING RODS

Sven-Eric Persbeck, Torslanda, Sweden, assignor to Salen & Wikander AB, Solna, Sweden

Filed Sep. 11, 1984, Ser. No. 649,593
Claims priority, application Sweden, Sep. 12, 1983, 8304860
Int. Cl.[4] B23K *37/02*
U.S. Cl. 266—77 **4 Claims**



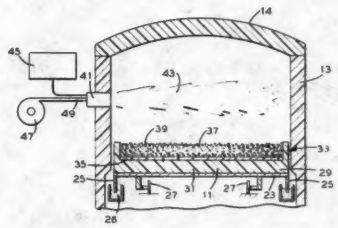
1. A holder for comprising: an attachment for the rod, a sleeve in said attachment for enclosing a rear end of the rod to form a seat therefor, said attachment having a shoulder, means for supplying gas under pressure to said sleeve for passage into the rod from said rear end, said sleeve being movable from a front position for receiving the rod to a rear position forming the working position of the rod, in said rear position said sleeve being located in said attachment in a space connected to said supply means, and in said front position said sleeve resting against said shoulder, said sleeve being movable from said rear position by pressure from said supply means to said front position against said shoulder, impact against said shoulder by said sleeve ejecting the cutting rod from said seat out of said sleeve.

4,597,564

ROTARY HEARTH

Richard H. Hanewald, Beaver Falls, and John K. Pargeter, Ellwood City, both of Pa., assignors to The International Metals Reclamation Company, Inc., Ellwood City, Pa.

Filed May 23, 1985, Ser. No. 737,277
Int. Cl.[4] F27B *9/16*
U.S. Cl. 266—274 **5 Claims**



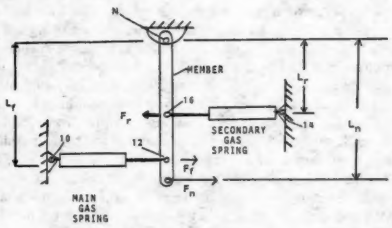
1. A rotary hearth employable in a rotary hearth furnace comprising a supportive, insulative impervious base supporting inner and outer containing walls, said hearth being adaptable to rotate in an essentially horizontal plane around an axis, said base having a top surface exposed to heat which top surface comprises loose granular refractory material bounded by said inner and outer containing walls.

4,597,565

TEMPERATURE COMPENSATED GAS SPRING MECHANISM

Richard C. Smith, Pittsburgh, Pa., assignor to Fichtel & Sachs Industries, Inc., Colmar, Pa.

Filed Aug. 24, 1984, Ser. No. 644,498
Int. Cl.[4] F16F *9/48*
U.S. Cl. 267—64.13 **4 Claims**



1. In a gas spring mechanism for applying biasing forces of selected magnitudes to a movable member tending to move it in a selected direction and having a main gas spring, including a first cylinder member and a first piston rod member, energized by a pressurized gas within said first cylinder and coupled, by one of said first cylinder and first piston rod members, to the movable member to apply primary forces to the movable member in the selected direction, the improvement wherein the pressurized gas is adapted to generate forces in the main gas spring of magnitudes in excess of the selected forces, said pressurized gas being characterized by (1) a first change in pressure with temperature and (2) a change of pressure with volume such that the primary forces vary with the displacement of the first piston rod relative to the first cylinder member, and in that there is a secondary gas spring, including a second cylinder member and a second piston rod member, energized by a two-phase vapor-liquid system having a vapor pressure characterized by a second percent change in pressure with temperature at temperatures below the critical tempera-

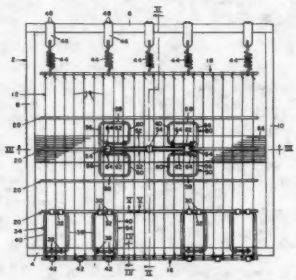
ture of said system, and coupled to the movable member by one of said second cylinder and piston rod members to apply forces to it in a direction opposite to the selected direction, said two-phase system being adapted to generate forces in the secondary gas spring of magnitudes approximately equal to the excesses of the primary forces over the selected forces and said second percent change of pressure with temperature being greater than said first percent change of pressure with temperature, thereby at least partly to compensate for changes in the pressure of said pressurized gas due to temperature variations.

4,597,566

SPRING DECK FOR UPHOLSTERED SEATING

Jerry G. Scrivner, Ash Grove, Mo., assignor to Flex-o-lators, Inc., Carthage, Mo.

Filed Apr. 10, 1985, Ser. No. 721,898
Int. Cl.⁴ F16F *3/04*
U.S. Cl. 267—91 **10 Claims**



1. A spring deck for upholstered seating comprising:
a. an open seat frame,
b. a thin deck sheet freely flexible transversely of its plane but inelastic in its plane, said sheet being arranged over said frame,
c. means securing a pair of opposite edges of said deck sheet to corresponding edges of said frame, said securing means at at least one edge of said deck sheet being resiliently yieldable in the plane of said sheet, whereby said sheet would normally be held yieldably substantially in a plane determined by said edge securing means, but may yield resiliently downwardly responsively to top loading thereof, said deck sheet being adapted to support upholstery padding material thereover, and
d. resilient sub-support means disposed beneath said deck sheet generally centrally between its edge securing means, said sub-support means being based in said frame, and being tensioned to deflect the central portion of said deck sheet upwardly from a plane determined by the edge securing means of said deck sheet, when said resilient edge securing means and said sub-support means are balanced and at rest, with no load applied to said deck sheet.

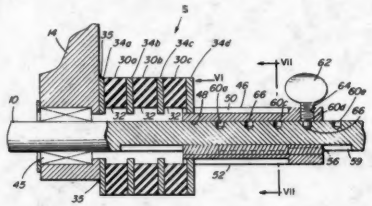
4,597,567

ADJUSTABLE TORSION SPRING

Romulus Racca, Weston, Mass., assignor to Barry Wright Corporation, Newton, Mass.

Filed Oct. 26, 1984, Ser. No. 665,319
Int. Cl.⁴ F16F *1/14, 1/36*
U.S. Cl. 267—140.2 **14 Claims**

1. A spring for creating adjustable torsional resistance between two members which are pivotal relative to each other, comprising:
a stack of axially aligned elastomer torsion rings, each torsion ring having an internal aperture,
axially aligned locking rings firmly secured to and separating adjacent torsion rings, there being one locking ring associated with each torsion ring, each locking ring having an internal aperture,
the stack of torsion rings and locking rings being firmly attached to a first pivotal member,
an elongate connecting means slidable into and out of the aperture in the stack,
at least one axially extending slot in the connecting means,
at least one tang on each locking ring projecting into the aperture in the stack and aligned with and engageable within the slot in the connecting means,



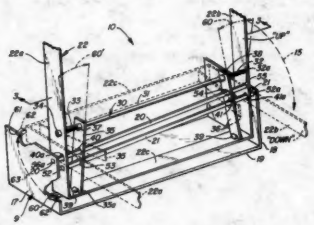
means preventing the connecting means from rotating relative to the second pivotal member and
means for positioning the connecting means at predetermined axial positions relative to the stack to engage the slot in the connecting means selectively with the tangs of one or more locking rings to selectively change the number of torsion rings exposed to the pivotal motion between the members to vary the torsional resistance of the spring.

4,597,568

ADJUSTABLE TORSION BAR ASSEMBLY

Gerrit K. Drexhage, 21 Bernard, Mill Valley, Calif. 94941

Filed Apr. 24, 1984, Ser. No. 603,489
Int. Cl.⁴ F16F *1/14*
U.S. Cl. 267—154 **10 Claims**



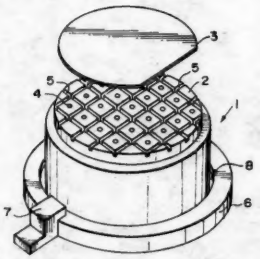
1. An adjustable torsion bar assembly for a structure pivotably moveable from a first to a second position comprising:
a torsion bar frame having a pair of spaced legs upstanding from a base;
first and second torsion bars;
a pivotable structural frame having a pair of sides extending inwardly of and parallel to said torsion bar frame upstanding legs;
one end of each of the torsion bars being fixedly connected to one of said torsion bar frame spaced legs and the other end of each of said torsion bars being fixedly connected to a structural frame side most removed from said one of said legs; and
means extending between said pair of structural frame sides and in contact with a spaced portion of each of said first and second torsion bars intermediate the ends of said first and second torsion bars for adjusting the effective twist length of both of said torsion bars between a torsion bar frame spaced leg and a structural frame side.

4,597,569

ATTRACTION HOLDING DEVICE

Shigeru Itamoto; Kiyoshi Suzuki, and Kenji Yasuda, all of Oomiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Saitama, Japan

Filed Dec. 31, 1984, Ser. No. 688,011
Claims priority, application Japan, Jan. 10, 1984, 59-1548
Int. Cl.[4] B25B *11/00*
U.S. Cl. 269—21 7 Claims



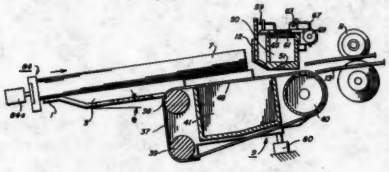
1. An attraction holding device comprising:
a body having a plurality of suction passages;
a holding surface, adapted to hold an object thereon, having a plurality of holes communicating with said suction passages;
an air chamber communicating with said holes through said suction passages so as to attract said object by said holes; and
at least one flexible member airtightly defining said air chamber so as to control negative pressure within said air chamber.

4,597,570

FEEDABILITY SENSOR FOR A VACUUM CORRUGATED FEEDER WITH MOVABLE BACKSTOP

Raymond W. Huggins, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 4, 1984, Ser. No. 678,197
Int. Cl.[4] B65H *3/12*
U.S. Cl. 271—98 8 Claims



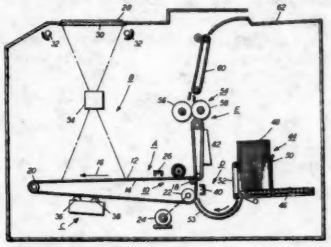
1. In a vacuum corrugation sheet feeder system having an air knife to provide air pressure to separate a bottom sheet from the remainder of the sheets in the stack in a sheet feeder tray, the sheets resting against a movable backstop, the method of controlling the air pressure comprising the steps of:
moving the backstop to drive said remainder of the sheets in the stack up the feeder tray allowing the stack of sheets to move down the feeder tray,
determining the coefficient of friction beween the bottom sheet and the remainder of the sheets in the stack, and
controlling the amount of air pressure from the air knife until a predetermined coefficient of friction is achieved.

4,597,571

SHEET FEEDER STACK SUPPORT

Thomas P. Redding, Penfield, and H. William Gray, Honeoye Falls, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 25, 1984, Ser. No. 624,555
Int. Cl.[4] B65H *1/02*
U.S. Cl. 271—150 10 Claims



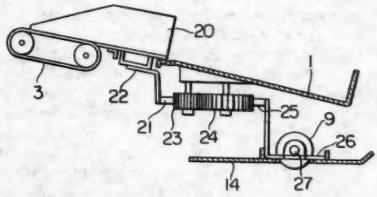
1. An apparatus for advancing successive flexible sheets from a stack thereof, including:
a substantially planar member having a groove therein extending in an endless curvilinear path;
means, mounted rollably in the groove of said planar member, for engaging the side edge of the stack in one portion of the groove and being spaced from the side edge of the stack in the other portion of the groove;
means for feeding successive, outermost sheets from one side of the stack on said rollable means; and
means, engaging the outermost sheet of the other side of the stack on said rollable means, for moving the stack toward said feeding means so as to position successive, outermost sheets of said one side of the stack in feeding relationship therewith.

4,597,572

ORIGINAL SUPPLY APPARATUS FOR USE IN COPYING MACHINE

Yasuyuki Nukaya, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Sep. 11, 1984, Ser. No. 649,381
Claims priority, application Japan, Sep. 16, 1983, 58-170985
Int. Cl.[4] B65H *1/06*
U.S. Cl. 271—171 2 Claims



1. In a copying machine comprising a tray for holding documents to be copied, an adjustable side guide member associated with said tray and movable laterally with respect thereto for adjustment to accomodate documents of different sizes, a contact glass for receiving a document from said tray and supporting the document for copying and a carrier roller for moving the document along said contact glass, the improvement which comprises; means supporting said carrier roller for lateral movement with respect to said contact glass in the same direction as said side guide member moves with respect to said

tray, and an interlocking mechanism for effecting point movement of said carrier roller and said side guide member so that said carrier roller is always located at the center of the document on said contact glass, said interlocking mechanism including first and second gears rotatably mounted on the underside of said tray and meshed with each other for simultaneous rotation, a first rack coupled to said side guide member for movement therewith in response to lateral movement of said side guide member, said first rack being meshed with said first gear so that said first gear is rotated and thereby said second gear is rotated when the position of said side guide member is adjusted, and a second rack meshed with said second gear and coupled to said carrier roller so that rotation of said second gear caused by lateral movement of said guide member causes lateral movement of said carrier roller

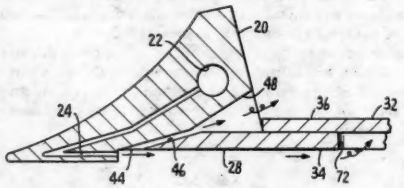
---

4,597,573

SYSTEM FOR HANDLING DISCRETE SHEETS

Imants Reba, Vancouver, Wash., and Rodney E. Pollock, Portland, Oreg., assignors to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Feb. 7, 1985, Ser. No. 699,277
Int. Cl.[4] B65H *29/24*
U.S. Cl. 271—195 **21 Claims**



1. Apparatus for handling discrete sheets having planar surfaces, said apparatus comprising:

means defining a support surface;

nozzle means spaced from said support surface, said nozzle means defining a plurality of spaced air flow outlets for directing air in a predetermined direction and operable to produce a gaseous flow including first and second gaseous flow components, said first component exerting a suction force on said sheets in a direction substantially normal to the planar surfaces of said sheets to lift said sheets from said support surface, and said second component exerting a propelling force on said sheets in a direction substantially corresponding to the plane of the sheet planar surfaces; and

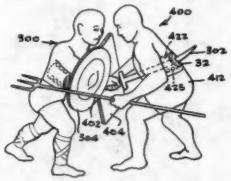
means including plate means extending from said nozzle means defining an air flow surface leading from said nozzle means and forming a passageway with said support surface, said air flow surface adapted to receive said second component and direct said second component away from said nozzle means, said plate means having at least a portion thereof defining an air flow surface portion in general alignment with said air flow outlets in said predetermined direction, said nozzle means and said plate means portion defining a gap therebetween, said nozzle means including a Coanda fluid flow attachment surface leading from said gap away from said predetermined direction whereby some of the air flow exiting from said air flow outlets will be directed away from said predetermined direction due to the Coanda effect and form said first component.

4,597,574

TOY APPARATUS SIMULATING HUNTING OR COMBAT

Henry S. Wolfe, P.O. Box 6025, Clearwater, Fla. 33518

Filed May 7, 1985, Ser. No. 731,577
Int. Cl.[4] A63F *9/00*
U.S. Cl. 273—85 F **24 Claims**



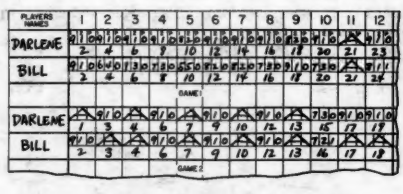
1. An amusement device for simulating a hunted animal target figure comprising a body of a relatively hard material having the physical characteristics and appearance of an animal, said body having at least one cavity extending to the surface of the body, and clay-like material in said cavity, and an additional figure having in combination therewith a simulated weapon.

4,597,575

METHOD OF PLAYING A BOWLING GAME

Max E. Kosof, 5480 S. 1225 East, Ogden, Utah 84403

Continuation-in-part of Ser. No. 134,921, Mar. 28, 1980, abandoned. This application Jul. 14, 1981, Ser. No. 283,225
Int. Cl.[4] A63D *5/00*
U.S. Cl. 273—37 **1 Claim**



1. A method of playing a bowling game in which players are allowed a preselected maximum number of balls to knock down all pins in each of a preselected plurality of frames, said method comprising:

(a) requiring each player to deliver at least one of said preselected maximum number of balls in each of said frames;

(b) counting the number of balls delivered by each player in each frame and the number of each player's pins remaining standing at the end of said frame;

(c) adding the number of balls delivered by each player in each frame to the number of each player's pins remaining standing at the end of said frame, to determine a score for each player for each frame;

(d) recording each player's frame score;

(e) adding each player's frame scores to determine said player's total score for the game; and

(f) comparing the players' game scores to determine the winner of the game.

4,597,576
SPORTS RACQUET UTILIZING NON-CIRCULAR STRINGS

James Haythornthwaite, 567 Main Road, Hudson, Quebec, Canada (J0P 1J0)

Filed Jul. 9, 1984, Ser. No. 628,993
Int. Cl.[4] A63B *51/00*
U.S. Cl. 273—73 D 1 Claim

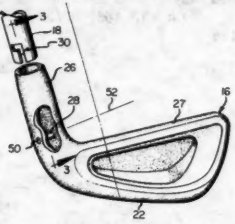
1. A tennis racquet comprising:
an annular head portion defining a central opening;
an elongated handle portion;
a neck portion connecting said head portion and said elongated handle portion;
said annular head portion, said elongated handle portion and said neck portion defined by a tennis racquet frame;
strings attached to said tennis racquet frame, said strings having a non-twisted configuration along their lengths, and said strings being interwoven to cross each other and form a single grid pattern within said central opening such that said strings form crossover points;
substantially all of said strings of said single grid pattern having an elliptical cross-sectional shape; and
said single grid pattern being formed such that at said crossover points, the largest peripheral side surface of one of said strings engages the largest peripheral side surface of a crossing string at each crossover point formed by said single grid pattern for resisting sliding movement of one string over another due to frictional impedance caused by said elliptical cross-sectional shape,
said peripheral side surfaces of said strings being located in said single grid pattern to form two opposed hitting surfaces, the peripheral side surfaces of said strings forming said hitting surfaces being the largest peripheral side surface of said strings for maximum string to ball surface contact area.

4,597,577
GOLF CLUB ASSEMBLY SYSTEM AND METHOD

Anthony Lamanna, 24 N. 38 Valley Rd., Lake Zurich, Ill. 60047

Filed Dec. 11, 1984, Ser. No. 680,475
Int. Cl.[4] A63B *53/02*
U.S. Cl. 273—80.1 13 Claims

4. A golf club assembly including: a hollow shaft member having a first end portion, a slot cut in said first end portion and opening to the end of the shaft, said slot including a generally axially extending portion opening to the end of the shaft and a generally circumferentially extending portion which terminates in an end wall providing abutment means; a club head attachable to said first end portion of the shaft, said club head including a hosel portion which further includes a hollow bore for receiving said shaft first end portion, a projecting pin member carried by said hosel and extending into said bore, such that said pin may be engaged in said slot and the club head rotated to bring said pin into engagement with said abutment means, said engagement defining the limit of relative rotatable movement between said club head and shaft in a first circumferential direction, to align said club head with said shaft and further to prevent rotation of the club head in said first circumferential

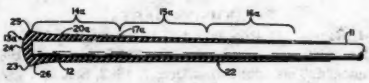


direction in response to forces normally encountered when a ball is struck, and means for preventing relative axial movement and rotation of said club head relative to said shaft in a second circumferential direction, opposite to said first direction once said club head is assembled.

4,597,578
GOLF CLUB GRIP

John B. Lancaster, Wagram, N.C., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 580,330, Feb. 15, 1984, abandoned.
This application Mar. 14, 1985, Ser. No. 712,334
Int. Cl.[4] A63B *53/14*
U.S. Cl. 273—81 R 1 Claim



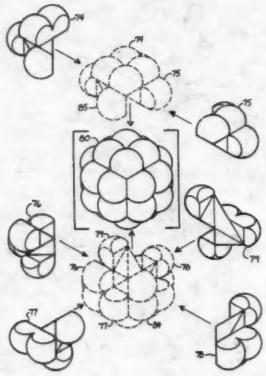
1. A golf club adapted to be mounted on a shaft of a golf club comprising an elongated body formed from a moldable resilient material, said body having a longitudinal axis and an external surface having a substantially circular cross sectional configuration throughout the length of said body, an elongated cavity disposed coaxially to the longitudinal axis of said body and adopted to receive a club shaft, the internal surface of the cavity being substantially circular in cross section and of uniform diameter, said grip at approximately three inches from the upper end thereof having a first diameter of approximately 0.860 inches, the diameter of said grip progressively increasing from said first diameter towards the cap end of said grip at a rate of approximately 0.030 inches per inch of length for a distance of approximately two inches from said first diameter, said diameter continually increasing progressively toward the cap end of said grip to a maximum diameter greater than one inch located adjacent the cap end, the lower two-thirds of said grip decreasing in diameter, from said first diameter, at a rate of 0.02 inches per inch of length of the grip toward the end opposite the end cap, whereby the grip at the upper one-third thereof provides a secure feel for a more confident grip with a golfer's hand and better control of the golf club, and the lower two-thirds thereof discourages overcontrolling the club with other hand.

4,597,579

THREE-DIMENSIONAL ASSEMBLY PUZZLE WITH ASYMMETRICAL PIECES THAT INTERLOCK INTERCHANGEABLY

Dale W. Walton, 301 W. 31st St., Richmond, Va. 23225

Filed May 1, 1985, Ser. No. 729,187
Int. Cl.[4] A63F *9/12*
U.S. Cl. 273—156 **20 Claims**



20. A three-dimensional assembly puzzle having six physically interchangeable asymmetrical pieces;

any pair of said pieces mating in exactly six substantially distinct ways;

said six pieces assembling in exactly three substantially distinct arrangements;

said arrangements dividing into pairs of subassemblies along three mutually perpendicular axes; and

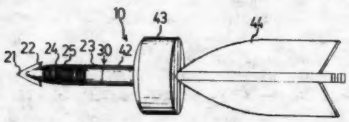
said subassemblies comprising six substantially distinct arrangements of said pieces.

4,597,580

POISON DART

Jon M. Gassie, 316 Roosevelt St., Lafayette, La. 70501

Continuation-in-part of Ser. No. 214,506, Dec. 8, 1980, abandoned. This application Dec. 1, 1982, Ser. No. 432,969
Int. Cl.[4] F41B *15/00*; A63B *65/02*
U.S. Cl. 273—418 **8 Claims**



1. A payload dart which comprises:

a front part which carries the payload and becomes completely buried into and anchored in flesh during the operation of said payload dart;

means, located on said front part, for anchoring said front part in said flesh;

a rear part which is joined to and is separable from said front part, said rear part remaining at least partly exposed during said operation and remaining joined with said front part during said operation unless, after said front part is completely buried and anchored, rearward force sufficient to cause separation is applied to said rear part; and

means located on said front part and rear parts, for joining and allowing separation of said front and rear parts, said joining means joining said front and rear parts with a force less than the force required to pull said front part from its position after said front part has become anchored in said flesh.

2. A poison dart comprising:

poisonous means for injuring a person;

means in contact with said poisonous means for delaying the functioning of said poisonous means after said poisonous means has been delivered into the flesh of said person; and

a payload dart for carrying and delivering said poisonous means and said delaying means into said flesh.

6. A method of subduing a person exhibiting undesireable behavior comprising the steps of:

(a) providing a poison dart with (1) poisonous means for injuring said person, and (2) means for delaying the functioning of said poisonous means after said poisonous means has been delivered into the flesh of said person; and

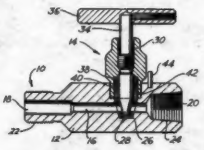
(b) delivering said poisonous means and said delaying means into the flesh of said person by striking said person with said dart.

4,597,581

PRESSURE SEAL FOR VALVE STEMS AND THE LIKE

Spencer M. Nimberger, Houston, Tex., assignor to General Screw Products Company, Houston, Tex.

Filed Apr. 30, 1985, Ser. No. 729,032
Int. Cl.[4] F16J *15/10*; F16K *41/04*
U.S. Cl. 277—12 **20 Claims**



1. In a valve including a valve body, a seat, and a valve stem having a central axis and rotatable within said valve body for sealing engagement with said seat, an improvement for sealing an annulus between said valve body and said stem, said improvement comprising:

an annular outer member having an envelope-shaped cross-sectional configuration formed from a first plastic material and having an outer annular leg for sealing engagement with said valve body, an inner annular leg for sealing engagement with said rotatable valve stem, and a base portion interconnecting said legs;

each of said first and second legs extending axially from said base portion and terminating at a location axially opposite said seat with respect to said base portion;

an annular core member having an elliptical cross-sectional configuration formed from a second plastic material sandwiched between said first and second legs for exerting a radially directed force on each of said legs for sealing said annulus;

said legs and said base portion at least substantially encapsulating said core member and sealing said core member from fluid within said valve; and

a retainer in said annulus for limiting axial movement of said outer member upon rotation of said valve stem to open and close said valve.

4,597,582

FLOCKED FIBER SEAL FOR ROLLING BEARINGS

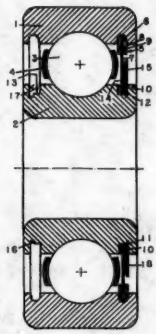
Heinrich Müller, Stuttgart, Fed. Rep. of Germany, assignor to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Jun. 6, 1985, Ser. No. 741,870

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1984, 8417328[U]

Int. Cl.[4] F16J 15/453, 15/34; F16C 33/80

U.S. Cl. 277—53 2 Claims



1. A seal for roller bearings having inner and outer rings, especially for bearings in electrical machines, comprising at least two sealing disks spaced a certain distance apart on one or both sides of the rolling elements between the rings, one of said sealing disks being attached to one of the bearing rings and with its free end engaging in an annular groove in the other bearing ring, and where the gap between the disks is sealed by flock fibers, characterized in that the one sealing disk (5), on its free edge near the annular groove (13), has flock fibers (10) projecting perpendicularly from its surfaces, which fibers are arranged to make slight frictional contact with the surfaces (11,12) of the annular groove (13) and with the opposite lateral surface (14) of the other sealing disk (15), said other sealing disk (15) being slotted and nonrotatably mounted in the annular groove (13) and having, on the lateral surface facing the sealing disk (5), a layer of flock fibers (18), the free ends of which are in contact with the sheet metal part (7) of the sealing disk (5).

4,597,583

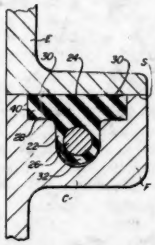
GASKET ASSEMBLY FOR SEALING COVERS TO AUTOMOTIVE ENGINES

Josefino T. Inciong, Des Plaines, and Frank L. Miszczak, Frankfort, both of Ill., assignors to Felt Products Mfg. Co., Skokie, Ill.

Filed Jul. 8, 1985, Ser. No. 752,616

Int. Cl.[4] F16J 15/12

U.S. Cl. 277—235 B 10 Claims



1. A gasket assembly comprising an elongated body having a first elongated elastomeric sealing section adapted to be positioned and compressed between an engine and a cover to provide a seal therebetween,

a second elastomeric rigidifying bead, said section and bead being integrally molded, and said bead being disposed at an angle to said section, and

a stiffening element fast with said rigidifying bead to rigidify said elongated body, said stiffening element being out of the zone of said sealing section.

4,597,584

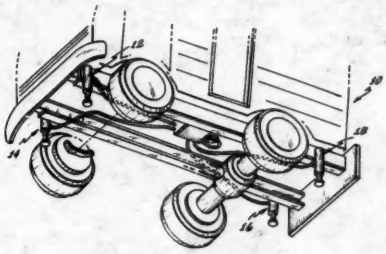
AUTOMATIC LEVELLING SYSTEM

Paul E. Hanser, Wilton, Iowa, assignor to HWH Corporation, Moscow, Iowa

Filed May 1, 1984, Ser. No. 605,802

Int. Cl.[4] B60S 9/00

U.S. Cl. 280—6 R 63 Claims



1. In combination for use in a vehicle with suspension means including inflatable air bags to level the vehicle relative to gravity,

a plurality of jacks each disposed at an individual position relative to the vehicle and in displaced relationship to the other jacks for adjusting the vertical position of the vehicle at the individual positions relative to gravity,

means disposed relative to the vehicle for sensing the tilting of the vehicle from a level disposition relative to gravity,

means responsive to the sensing means for operating the jacks in a particular sequence to obtain an adjustment in the vertical position of the vehicle at the individual positions and to obtain a resultant levelling of the vehicle relative to gravity,

means responsive to a levelling of the vehicle for lowering to the ground any of the jacks still displaced from the ground, and

means for deflating the air bags before any operation of the jacks to level the vehicle.

4,597,585

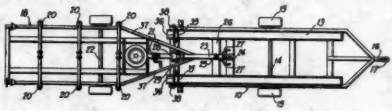
TRAILER CARAVAN

Robert J. Littlejohn, Greenville, S.C., assignor to Marvin L. Ellenburg, Easley and Samuel L. Huffman, Greenville, both of, S.C.

Filed Nov. 20, 1984, Ser. No. 673,363

Int. Cl.[4] B62D 53/00; B60P 3/10

U.S. Cl. 280—411 C 7 Claims



7. In a trailer caravan, a first trailer and a second trailer in tandem relationship, the second trailer having a tongue overlying a rear end portion of the first trailer, a vertical axis coupling and pivot pin interconnecting the first trailer and said tongue of the second trailer, a tie-down bar on the first trailer near its

rear end and spaced rearwardly of said coupling and pivot pin and extending across the top of said tongue and adjacent to the sides of the tongue in somewhat spaced relationship therewith, a pair of tongue radius adjusting elements on said tie-down bar substantially in alignment with the opposite sides of said tongue, and said tongue radius adjusting elements comprising a pair of substantially coaxial adjusting screws having locking means thereon.

4,597,586

PYROTECHNIC TENSIONER FOR VEHICLE SAFETY BELT

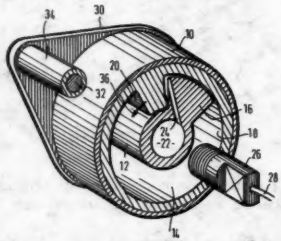
Wilfried Burghardt, Altomuenster; Karl E. Nilsson, Ottobrunn, and Hans-Hellmut Ernst, Sulfeld, all of Fed. Rep. of Germany, assignors to Britax-Kolb GmbH & Co., Dachau, Fed. Rep. of Germany

Filed Oct. 9, 1984, Ser. No. 658,538

Claims priority, application United Kingdom, Oct. 7, 1983, 8326889

Int. Cl.[4] B60R *21/10*

U.S. Cl. 280—806 **8 Claims**



1. Apparatus for tensioning a strap of a vehicle safety belt system comprising a cylindrical drum, a first roller journaled on a stationary axis parallel to that of the drum and spaced radially outwardly from the surface thereof, a second roller mounted with its axis parallel to the axis of the drum at a radius between that of the surface of the drum and the first roller, means powered by a pyrotechnic charge for causing angular movement of the second roller about the axis of the drum, and additional guide means located at a greater radial distance from the axis of the drum than the second roller and oriented so that, prior to detonation of the pyrotechnic charge, the angular position of the second roller about the axis of the drum is between the first roller and the additional guide means and the strap does not touch the surface of the drum as it follows the shortest path from the additional guide means, between the second roller and the drum to the first roller, and so that detonation of the pyrotechnic charge causes the second roller to pass between the first roller and the surface of the drum thereby lengthening the path of the strap between the first roller and the additional guide means.

4,597,587

SEATBELT SYSTEM

Noritada Yoshitsugu; Motonobu Sugiura, and Yutaka Matsuzaki, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Nov. 27, 1984, Ser. No. 675,397

Claims priority, application Japan, Nov. 28, 1983, 58-183303[U]

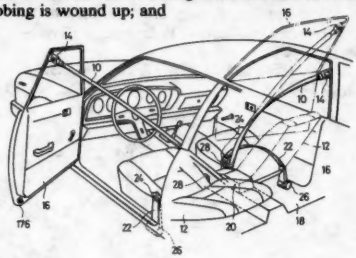
Int. Cl.[4] B60R *22/34*

U.S. Cl. 280—807 **21 Claims**

1. A seatbelt system including a webbing which has one end thereof attached to a door of a vehicle and is automatically fastened to an occupant of said vehicle after he is seated, comprising:

(a) a webbing retractor which is disposed in an approximately central portion of said vehicle to wind up the other end of said webbing;

(b) a resilient member which is disposed within said webbing retractor to bias said webbing in a direction in which said webbing is wound up; and



(c) control means which drives said resilient member when said door is opened so that the biasing force of said resilient member is decreased,

whereby the resistance to a door opening force encountered when said door is opened is reduced.

4,597,588

DEVICE FOR ADJUSTING WEBBING-SUPPORTING POSITION

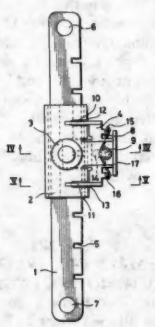
Osamu Kawai, Fujisawa, Japan, assignor to NSK-Warner K.K., Japan

Filed Sep. 7, 1984, Ser. No. 648,322

Claims priority, application Japan, Sep. 7, 1983, 58-137755[U]

Int. Cl.[4] B60R *22/00*

U.S. Cl. 280—808 **13 Claims**



1. In a device suitable for use in adjusting the supporting position of a webbing of a vehicle seat belt system, said device including a base having a plurality of latch portions, an adjustable anchor guided along a base, a latch member mounted on the adjustable anchor displaceably between an engagement position where the latch member is in engagement with any one of the latch portions so as to fix the adjustable anchor on the base and a non-engagement position where the latch member is kept out of engagement with any of the latch portions so as to permit movement of the adjustable anchor along the base, and manipulating means for bringing the latch member from the engagement position to the non-engagement position, the improvement wherein the adjustable anchor defines an inwardly-notched interlocking portion, the interlocking portion contains a substantially, turned, square U-shaped face extending at a right angle to the direction in which the adjustable anchor is guided, the latch member has a face engageable with the turned, square U-shaped face at the engagement position with the latter face being covered by the former face, and the latch

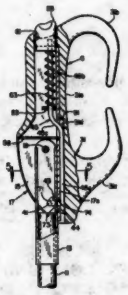
portions of the base are received withing the turned, square U-shaped face when viewed in the direction in which the anchor is guided.

4,597,589

PIVOTED GRIP SKI POLE

Ray K. Fujii, and William K. Brown, both of 2511 S. Troutdale Rd., Troutdale, Oreg. 97060

Filed Mar. 16, 1984, Ser. No. 590,148
Int. Cl.[4] A63C *11/22*
U.S. Cl. 280—821 5 Claims



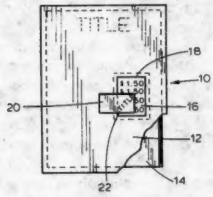
1. A ski pole comprising:
a pole member having a longitudinal axis,
a grip for the pole member,
means for mounting the grip on the pole member for pivotal movement from an in-line position to a transverse position,
said grip having a top surface,
latch means for releasably latching the grip in its in-line position,
said latch means having a trip located on the grip at the top of the grip,
means on said grip mounting said trip for movement in the direction parallel to the longitudinal axis of said pole member,
said trip being exposed at the top surface of said grip to be actuatable by axial pressure exerted thereagainst.

4,597,590

PROTECTIVE WRAPPER FOR PRINTED MATERIAL

George A. Papouchis, 604 E. Lincoln Way, Ames, Iowa 50010

Filed Jan. 7, 1985, Ser. No. 689,061
Int. Cl.[4] B42D *3/04, 3/00*
U.S. Cl. 281—34 2 Claims



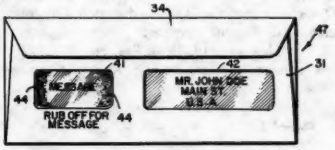
1. A protective wrapper for printed material that has pricing information on its cover and is displayed for purchase by a customer, comprising:
(a) a substantially opaque sleeve-type removable cover into which the printed material can be inserted to substantially shield the printed material from viewing as it is on display;
(b) a window in the cover through which price information can be displayed when the printed material is inside the removable cover said window being formed by the edges of a hole in said cover; and
(c) means for displaying the identity of the printed material in association with said removable cover, which means is adjustable by a customer said displaying means comprising a foldable tab having an end portion, upon which the identity of the printed material can be displayed to protect the confidentiality of the identity of the covered printed material as it is being purchased.

4,597,591

ENVELOPE WITH CONCEALED MESSAGE WINDOW

Wilfred H. Gendron, Wilbraham, and Frank T. Knapp, Chicopee, both of Mass., assignors to Westvaco Corporation, New York, N.Y.

Filed Jun. 6, 1984, Ser. No. 617,739
Int. Cl.[4] G09B *29/00;* B42D *15/00*
U.S. Cl. 283—1 B 11 Claims



1. An envelope for use in communicating a hidden message which is revealable without opening the envelope, said envelope including at least one rectangular panel having inner and outer surfaces and additional panels which together with said rectangular panel provide an envelope pocket and closure flap, said envelope comprising:
(a) at least one window opening formed in said rectangular panel;
(b) a sheet of normally transparent window material adhered to the inner surface of said rectangular panel so as to cover said window opening;
(c) a layer of non-transparent but removable coating material applied to the outer surface of said window material in the region of said window opening so as to obscure said window; and,
(d) a message located inside said envelope pocket printed on an insert or on one of said additional panels and positioned beneath said obscured window, wherein said message may be revealed without opening the envelope by removing the coating from the outer surface of said window material.

4,597,592

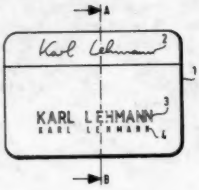
IDENTIFICATION CARD WITH DUPLICATE DATA

Thomas Maurer, Apolloweg 12, Munich 60, and Ludwig Devrient, Mauerkircherstr. 168, Munich 81, both of Fed. Rep. of Germany (D-8000)

Filed Dec. 21, 1983, Ser. No. 563,770
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1982, 3248784
Int. Cl.[4] B42D *15/00*
U.S. Cl. 283—75 6 Claims

1. In an identification card including alphanumeric characters, which are present in high-embossed form so as to be used as a printing block, and further printed information in the form of alphanumeric characters or images, the improvement comprising, said card including, in addition to the high-embossed

characters, a set of data with identical information content as said high-embossed characters, this data set being inscribed in



the material of the identification card by means of a laser beam so as to be visually recognizable without any auxiliary aids.

4,597,593

IDENTIFICATION CARD AND A METHOD OF PRODUCING SAME

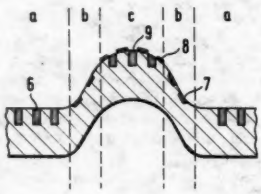
Thomas Maurer, Munich, Fed. Rep. of Germany, assignor to GAO Gesellschaft fur Automation und Organisation mbH, Munich, Fed. Rep. of Germany

Filed Apr. 19, 1984, Ser. No. 602,079

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1983, 3314327

Int. Cl.[4] B42D *15/00*

U.S. Cl. 283—91 **5 Claims**



1. An identification card comprising high-embossed alphanumeric characters formed of card material capable of being used as a printing block, wherein the surface of the card has locally embossed areas corresponding to the characters and intermediate areas between said locally embossed areas and non-embossed card areas at which the surface of the card is inclined with respect to the plane of the card; a security pattern inscribed by a laser beam recorder on the card material in the area of the card including the embossed characters, said security pattern appearing as a change of color in the card material, said security pattern extending over intermediate and non-embossed areas of the card in such a manner that, when observed normally with respect to the card plane, the security pattern appears free of distortion.

4,597,594

HOSE CONNECTOR

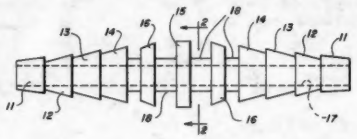
Christ D. Kacalieff, St. Louis County, Mo., and Charles E. Causey, Granite City, Ill., assignors to Chris Kaye Plastics Corp., St. Louis, Mo.

Continuation of Ser. No. 530,518, Sep. 9, 1983, abandoned. This application Nov. 4, 1985, Ser. No. 794,770

Int. Cl.[4] F16L *33/00*

U.S. Cl. 285—239 **8 Claims**

1. A connector for connecting pressure fluid conducting hoses having flexible walls, said connector comprising: an axially elongated one-piece molded plastic body having opposite open ends and an internal fluid carrying bore communicating with said opposite ends, said body being continuous around the bore so as to form a leak proof uninterrupted wall around the bore and throughout the elongated body, said body being formed axially inwardly from adjacent its opposite ends with an external series of separately formed barb rings of progressively increasing diameter as measured axially inwardly from the opposite open ends, said increasing diameter of said barb rings imparting a tapering configuration to said body which diverges toward a midposition of said body, and said body



being formed in the midposition with a plurality of body encircling rib means arranged in axially spaced relation to expose portions of the wall therebetween, said rib means having diameters which cause said rib means to project outwardly beyond any of said barb rings to provide at least one annular groove for a manual grip for holding said body during insertion and removal of a hose.

4,597,595

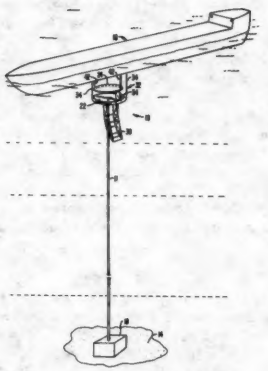
SWIVEL-LESS COUPLING APPARATUS

Norman R. Wallace, Walnut Creek, Calif., assignor to Bechtel International Corporation, San Francisco, Calif.

Filed Feb. 26, 1985, Ser. No. 705,778

Int. Cl.[4] F16L *55/00*

U.S. Cl. 285—119 **16 Claims**



1. Apparatus for coupling a relatively fixed conduit to a rotatable support comprising:

a pair of vertically spaced members means coupling the members together to allow the upper member to be rotatable relative to the lower member about a first, generally vertical axis; means coupled with said upper member for connecting the latter to said support to permit the upper member to rotate with the support relative to the lower member;

a roller element; means rotatably coupling the roller element to said members, said roller element being between and rotatable relative to the members about a second axis transverse to the first axis as a function of the rotation of the members relative to each other; and

a flexible conduit segment extending between the members and partially about said element and movable into positions adjacent to the members, the conduit segment having a first end coupled to the lower member and adapted to be coupled to the fixed conduit and a second end

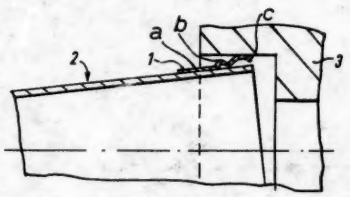
adapted to be coupled to support, each of the members having means for defining a conduit support surface thereon, said conduit segment being movable onto the support surface of the lower member and off the support surface of the upper member as the roller element moves about said first axis in one direction, said conduit segment being movable off the support surface of the lower member and onto the upper member as the roller element moves about said first axis in the opposite direction, the length of the conduit segment being sufficient to allow the upper member and the lower member to rotate about said first axis in either direction through an arc greater than 360°.

4,597,596

CYLINDER END SEAL

Michael J. C. Tozer, Stocksfield, England, assignor to Heat Transfer Technology Limited, St. Helier, Channel Islands

Filed Nov. 7, 1984, Ser. No. 668,936
Int. Cl.[4] F16L *55/00*
U.S. Cl. 285—187 **10 Claims**



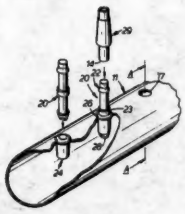
1. A cylinder end sealing sleeve made of metal and attachable co-axially over the outside of a cylinder and comprising successively along its length a constant diameter part intended to contact the cylinder wall and to be secured thereto; a first radially outwardly projecting annular corrugation and a second radially outwardly projecting annular corrugation which is of increased diameter and axial length compared with the first corrugation and intended to deform resiliently into sealing engagement with a housing or tube concentric therewith with said first radially outwardly projecting corrugation being spaced radially inwardly of said housing or tube and providing flexibility between said constant diameter part and said second corrugation.

4,597,597

CONNECTION ASSEMBLIES

Trevor J. Bloor, and Lawrence J. Walton, both of P.O. Box 388, Broadbeach, Queensland, 4217, Australia

Filed Mar. 14, 1983, Ser. No. 475,317
Claims priority, application Australia, Mar. 19, 1982, PF3219
Int. Cl.[4] F16L *5/02*
U.S. Cl. 285—196 **6 Claims**



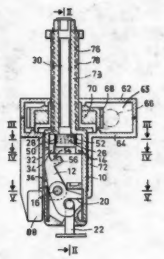
1. In combination with a fluid flow pipe having an aperture in its wall, a plug formed of resilient material, said plug having a shank portion extending through said aperture and engaged with the walls thereof, an enlarged annular head portion engaged with the outer surface of said pipe adjacent said aperture and a free end disposed within said flow pipe, said shank portion having an exterior surface normally tapering from said head portion to the opposite or free end of said plug, said plug further including a bore extending longitudinally therethrough, a spigot having a body extending through said bore to be sealingly engaged therewith, said body having a pair of annular enlarged portions, said enlarged portions being spaced apart a distance less than the length of said plug such that said plug head portion is required to be compressed by one of said enlarged portions to enable the other of said enlarged portions to move beyond said free end of said shank portion and wherein subsequent resilient expansion of said compressed head portion causes said spigot to move slightly outwardly of said pipe and said other enlarged portion to engage said free end of said shank portion to thereby longitudinally compress said shank portion causing radial expansion thereof on the side of said aperture opposite said head portion to resist detachment of said spigot and said plug from said pipe.

4,597,598

DEVICE FOR ELECTRICAL OPENING AND CLOSING OF A VEHICLE LID EQUIPPED WITH A LOCK OF THE COCKING TYPE

Jacques Bascou, Bazemont, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Nov. 26, 1984, Ser. No. 674,644
Claims priority, application France, Nov. 25, 1983, 83 18819
Int. Cl.[4] E05C *5/02*
U.S. Cl. 292—68 **14 Claims**



1. A device for locking and electrically opening and closing a motor vehicle lid, said device comprising:

a guide sleeve fixed relative to said lid;

a lock case moveable in said guide sleeve in a first direction;

a gearmotor fixed relative to said lid and including means for moving said lock case in two opposite senses of said first direction between a partial opening position and a closed position;

a latch pivotally mounted in said lock case for pivoting about an axis perpendicular to said first direction along an arc including a locked position and an unlocked position, said latch having a hook portion engagable with a striker fixed to said lid when said latch is pivoted into said locked position;

a locking lever having a pivot shaft pivotable about a pivot axis extending in said first direction, said pivot shaft having a control portion extending out of said lock case, said locking lever including means for locking said latch in said locked position; and

a first electric contact positioned such that when said case is in said partial opening position, said first electric contact is engaged and triggered by said latch when said latch moves from said locked position and in a direction away from said unlocked position, said gearmotor being opera-

tively connected to said first electric contact for moving said case to said closed position.

4,597,599

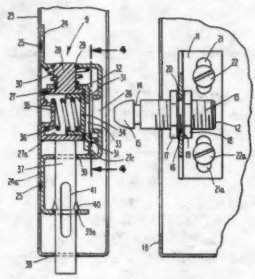
BLIND LATCH

Robert H. Bisbing, Springfield, Pa., assignor to Southco, Inc., Concordville, Pa.

Continuation-in-part of Ser. No. 576,130, Feb. 2, 1984, abandoned. This application Jul. 11, 1984, Ser. No. 628,131

Int. Cl.⁴ E05C *1/12*

U.S. Cl. 292—174 **10 Claims**



1. In a blind latching system for cabinet enclosures having a closure element movable between open and closed positions and a fixed cabinet and the like, the combination of a keeper sub-assembly adapted for attachment to said cabinet or the like, a latch sub-assembly adapted for attachment to an inner surface of said closure element and including a latch positioned for cooperative latching action with said keeper sub-assembly, and release means operatively positioned relative to said latch for unlatching said latch sub-assembly from said keeper sub-assembly, said latch sub-assembly being provided with a first biasing means positioned to act on said latch and with a second biasing means positioned to contact and to act on said keeper sub-assembly on movement of said closure element to said closed position, said latch sub-assembly including a movable latch guide positioned to operatively engage said latch and within which said second biasing means is contained.

4,597,600

DOOR HARDWARE

Rudolf Wilke, 4 Marsberger Strasse, and Bernd Friedrichs, Remmeker Ring 55, both of 3548 Arolsen, Fed. Rep. of Germany

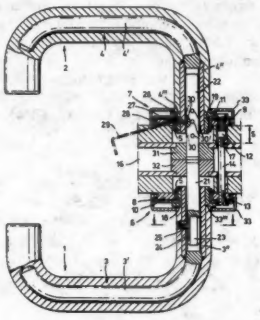
Filed Jul. 7, 1982, Ser. No. 395,977

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1981, 3127151

Int. Cl.⁴ E05C *21/02*

U.S. Cl. 292—336.3 **10 Claims**

1. Door hardware including an inside base part, first means for clamping said inside base part against the inside surface of a door, an outside base part, second means for clamping said outside base part against the outside surface of said door, a spindle adapted to extend through said door and having first and second sections, said sections being axially stationary but rotatably joined to each other, an inside door handle being mounted to said inside base part axially stationary, but rotatably with respect to said inside base part and having a first hollow end portion fitted onto said first spindle section, an outside door handle being mounted to said outside base part axially stationary, but rotatably with respect to said outside base part and having a second hollow end portion fitted onto said second spindle section, first means for enabling an axial adjustment and locking of said inside door handle on said first spindle section and second means for enabling an axial adjustment and locking of said outside handle on said second spindle section, said second clamping means including internally screw threaded sleeves extending through holes in said second base part and towards the door from one side thereof, and said first



clamping means including mounting screws extending through screwholes in said inside base part and into the door from the opposite side thereof and being screwed for threaded engagement into said threaded sleeves.

4,597,601

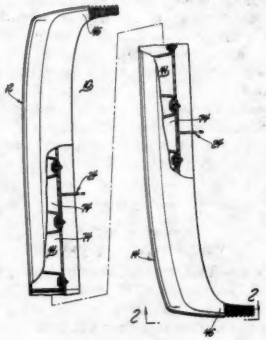
ENERGY ABSORBING VEHICLE BUMPER

Donald L. Manning, Orchard Lake, Mich., assignor to Transpec, Inc., Troy, Mich.

Filed Mar. 18, 1985, Ser. No. 712,854

Int. Cl.⁴ B60R *19/02*

U.S. Cl. 293—122 **8 Claims**



1. An energy absorbing vehicle bumper system of the type including a pair of identical beam members **(16)** adapted to be joined by a common plate member **(54)** at their horizontally inner ends to provide a bumper support structure for spanning the front end of a vehicle, bracket means **(24)** for mounting said beams to the vehicle, and energy absorbing means **(41)** supported upon said beam on the side thereof opposite from the bracket means, said energy absorbing means including a deflectable member **(44)** enclosed by an elastomeric outer cover means **(42)**, the improvement comprising:

A. each beam **(16)** having a generally U-shaped cross-section with a vertical wall portion **(18)** and a pair of horizontal leg portions **(20 and 22)** projecting rearwardly from the upper and lower edges of the vertical wall portion and away from said energy absorbing means;

B. the energy absorbing means **(41)** comprising a hollow, rigidified and deflectable structural member **(44)** having

(1) a rear wall secured to the front face of the vertical wall portion (18) of said beam member;
(2) a front wall (64) spaced forwardly of said rear wall;
(3) top and bottom walls (66 and 68) joining said front and rear walls;
(4) a plurality of horizontally spaced cavities (74) formed in said rear wall and extending toward said front wall (64);

C. fastening means (34–40) for securing said beam members to said bracket means; and

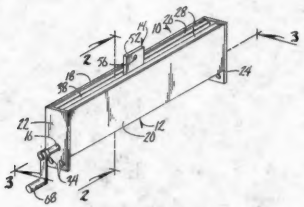
D. said elastomeric cover means (42) being molded about and enclosing the energy absorbing means and at least a portion of the cooperating beam member.

4,597,602

LOAD LEVELING DEVICE

Donald D. McGriff, 415 S. Main St., Baxter, Iowa 50028

Filed Mar. 4, 1985, Ser. No. 707,814
Int. Cl.⁴ B66C *1/10*
U.S. Cl. 294—81.3 **9 Claims**



1. A load leveling device for connecting a load to a lifting device, comprising:

an elongated frame assembly having first and second side frame members, first and second opposite end frame members, first and second spaced apart track members attached to said first and second side frame members respectively and having upper and lower surfaces, and first and second spaced apart flanges attached to said first and second side frame members respectively and spaced apart from said first and second track members respectively;

said side frame members, said track members, and said flanges forming an elongated channel;

first and second spaced apart attachment means on said elongated frame assembly for permitting attachment of said load to said elongated frame assembly;

a carriage assembly having bearing means within said channel and engaging said lower surface of said track members for permitting longitudinal movement of said carriage assembly along said track members and having first and second wing flanges extending towards said side frame members and positioned beneath said first and second flanges of said frame assembly respectively for limiting upward and rotational movement of said carriage assembly;

lead screw means rotatably mounted to said frame assembly and threadably engaging said carriage assembly for causing longitudinal movement of said carriage assembly on said track members;

power means connected to said lead screw means for causing rotating of said lead screw means to cause longitudinal movement of said carriage assembly on said track members:

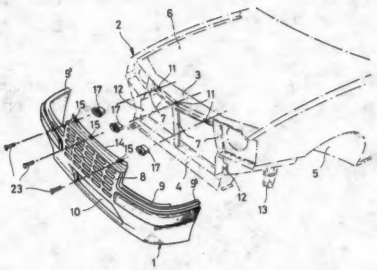
third attachment means pivotally connected to said carriage assembly for permitting attachment of said lifting device to said carriage assembly.

4,597,603

MOUNTING ARRANGEMENT OF A MOTOR VEHICLE FRONT-END COMPONENT MADE OF PLASTICS

Hans-Gerhard Trabert, Russelsheim, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed May 6, 1985, Ser. No. 730,817
Claims priority, application Fed. Rep. of Germany, May 10, 1984, 3417337
Int. Cl.⁴ B62D *27/06*
U.S. Cl. 296—194 **6 Claims**



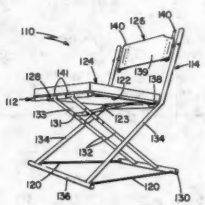
1. Arrangement of a motor vehicle front section made of synthetic material on the vehicle body, which front section consists of a bumper with an integrally molded radiator grille and is retained by interference fit in holes and slots on a frame of the body at least at two lower and three upper mounting points in the region of the longitudinal members of the body and an upper cross member connecting the wheel cases, characterized by the fact that in a mounting flange **14** of the radiator grille **8** are disposed holes **15** of large horizontal dimensions which correspond to slots **11** disposed obliquely in the cross member **3** at an acute angle (alpha) to the level **16** of the vehicle, wherein fastening means which pass through the corresponding pairs of holes respectively by interference fit are provided for mutual fixing with adjustable position.

4,597,604

SUPPORT STRUCTURES FOR CHAIRS AND THE LIKE HAVING PIVOTING MEMBERS

Mark Singer, 15 Madison St., Cambridge, Mass. 02138

Filed Dec. 30, 1983, Ser. No. 567,231
Int. Cl.⁴ A47C *4/00*
U.S. Cl. 297—18 **11 Claims**



1. A support structure for a piece of furniture comprising

a pair of transversely spaced rigid struts, the axes of said struts being inclined with respect to the horizontal and defining an imaginary planar surface passing through said struts,

a rigid member between said struts maintaining them in substantially fixed relationship to each other,

an integral rigid members, oppositely inclined with respect to the horizontal, having two upper end portions spaced from each other and two lower end portions spaced from each other and spaced from said struts, said integral rigid member intersecting said imaginary surface,

a first flexible tension member connecting said integral rigid member at or near its said upper end portions to said struts at

a first connection position on said struts above where said integral rigid member intersects said imaginary surface,

a second flexible tension member connecting said integral rigid member at or near said two lower end portions to said struts at or near their bottoms, and

a third flexible tension member connecting said struts at or near said first connection position to said integral rigid member above where said integral rigid member intersects said imaginary surface and below where said first flexible tension member is connected to said rigid member in position different from said first tension member to gradually inhibit forward pivoting of said struts and said integral rigid member.

4,597,605

COMBINED TOTE BAG AND SEAT CUSHION

Robert W. Gilbert, 8230 Mortenview, Taylor, Mich. 48180

Filed Nov. 5, 1984, Ser. No. 667,961

Int. Cl.[4] A47G *7/62*

U.S. Cl. 297—219 **3 Claims**

1. A combined tote bag and seat cushion comprising:

rectangular cushion means having side and end edges, said cushion means being adapted to fold double upon itself such that said end edges of said cushion means are adjacent to each other,

a flap forming a pocket affixed to one end edge of said cushion means, said pocket having closed sides, one closed end and an open end adjacent to said one end edge of said cushion means,

a pair of elastic straps respectively extending between and resiliently joinig corners of said pocket remote from said one cushion end edge and said side edge of said cushion means, said pocket having peripheral dimensions along its said side ends which are not greater than peripheral dimensions of said cushion means folded double upon itself, and

a pair of handle straps projecting from and having ends joined to corresponding remote end edges of said cushion means and a third handle strap having ends joined to said open end of said pocket for grasping and transporting said cushion means and pocket with said cushion means folded double upon itself.

4,597,606

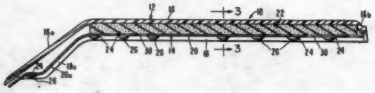
ARM CAP FOR AIRPLANE SEAT OR THE LIKE

Ted N. Magee, Hillsborough, Calif., assignor to Magee Plastics Company, San Mateo, Calif.

Filed Sep. 17, 1984, Ser. No. 650,954

Int. Cl.[4] A47C *1/12*

U.S. Cl. 297—422 **9 Claims**



1. A resilient support comprising:

a first member of resilient material, the first member having a top wall and a pair of spaced side walls integral with the top wall, the space between the side walls defining an opening in the first member opposite to the top wall, there being a number of generally flat tabs secured to and extending inwardly from the inner surfaces of the side walls, at least a number of said tabs being in a common plane;

a generally rigid, generally flat second member across said opening and spanning the distance between the side walls of the first member;

means extending through the tabs and the second member for interconnecting the second member and the tabs, and at least a major portion of said second member being in a plane substantially parallel with the plane of said tabs.

4,597,607

ARRANGEMENT FOR LOCKING AN ENTRAINMENT MEMBER FOR A SAFETY BELT

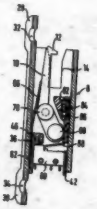
Michael Forkel, Coburg; Claus Dallwig, Rödental, and Hans-Joachim Volk, Ebersdorf, all of Fed. Rep. of Germany, assignors to Brose Fahrzeugteile GmbH & Co. KG, Fed. Rep. of Germany

Filed Sep. 10, 1984, Ser. No. 649,182

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1983, 33334354

Int. Cl.[4] B60R *21/00*

U.S. Cl. 297—468 **14 Claims**



1. A cassette for locking an entrainment member of a safety belt of a passenger car, comprising:

a guide profile comprised of a pressure-resistant cable for adjustably guiding said entrainment member along a limited path, a releasable locking element including spring means disposed in said cassette for locking said entrainment member, said cassette being formed in one piece in the shape of a tube and including insertion means for providing at least one confinement surface therein, said insertion means having a bottom surface, a free front surface, and a recess for receiving and supporting a hose enclosing said cable, and wherein said insertion means, on a lateral surface thereof that substantially rests against said cassette, includes means for supporting said spring means of said locking element.

4,597,608

AUTOMOBILE WINDSHIELD COVER

LaVern N. Duffy, 3723 Cadillac Dr., Waterloo, Iowa 50701

Filed Aug. 5, 1985, Ser. No. 762,436

Int. Cl.[4] B60J *1/20*

U.S. Cl. 296—95 C **5 Claims**

1. An improved automobile windshield cover to prevent frost, ice or snow from freezing on a windshield, said cover comprising:

(a) a shield portion formed by an elongated strip of pliable material sized to substantially cover all of said windshield;

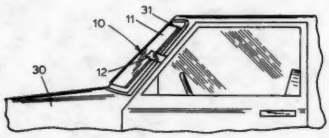
(b) at least one strap fixed to one of said shield portion, said strap having a node on its free end and being of a length sufficient to extend between one of the passenger or driver side front doors and the body of said automobile such that when said door is shut said strap is clamped between said

door and said body and said node serves as a retaining abutment to prevent the strap from being removed therefrom;

(c) at least one strap attachable to an opposite end of said shield portion and having means on one end for attachment to said shield portion and a node of its opposite end;

(d) at least one of said fixed and attachable straps is formed from a resilient material;

(e) means on said opposite end of said shield portion for cooperating with said attachment means on said attachable strap to semi-permanently fix said one end of said attachable strap to said opposite end of said shield portion; and



(f) said attachable strap being adapted to extend between the other of said passenger or driver side front door and the body of said automobile and be clamped therebetween when said door is shut, and be retained in such position by said node to prevent said attachable strap from being removed therefrom, said strap being of sufficient length that when said opposite end is retained in position by said node, said one end of said strap is attachable to said opposite end of said shield portion in such fashion that said resilient strap is in a partially sretched condition to urge said shield portion to lie tauntly against said windshield.

4,597,609

METHOD OF MELTING SULPHUR

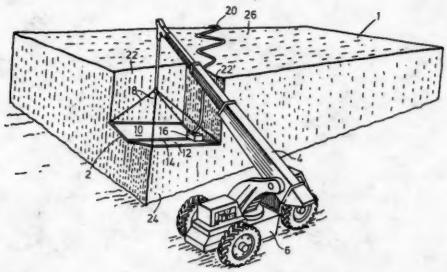
Andrew W. Deszynski, Calgary, and Andre Tucque, Drayton Valley, both of Canada, assignors to Burza Resources Ltd., Calgary, Canada

Filed Dec. 11, 1984, Ser. No. 680,622

Claims priority, application Canada, Jul. 31, 1984, 460054

Int. Cl.[4] E21C *41/14*

U.S. Cl. 299—6 **9 Claims**



1. A method for melting a block of sulphur, the method comprising the steps of:

(a) positioning a heating device having a plurality of top edges and a plurality of lower heating surfaces at a predetermined location on a block of sulphur, so that siad heating surfaces of the heating device are inclined downwardly from said top edges of the heating device and form a collection location in the block of sulphur beneath said heating surfaces when heat is supplied to the heating device, the heating device further having a means for withdrawing molten sulphur from the collection location, the collection location being adjacent to the means for withdrawing molten sulphur from the collection location;

(b) supplying heat to the heating device adjacent to said heating surfaces thereof to melt sulphur, so that the molten sulphur flows downwardly through spaces formed beneath said surfaces to the collection location;

(c) withdrawing molten sulphur by said means for withdrawing molten sulphur from the collection location; and

(d) progressively lowering th heating device downwardly through the block of sulphur as molten sulphur is withdrawn,

whereby the block of sulphur is melted without the necessity of leaving walls of unmelted sulphur and the heater is carefully lowered progressivley vertically downwardly.

4,597,610

LOAD-DEPENDENT BRAKE FORCE GOVERNOR

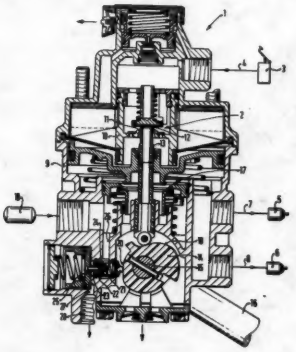
Werner Stumpe, Kornwestheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 19, 1980, Ser. No. 179,605

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1979, 2938718

Int. Cl.[4] B60T *8/18*

U.S. Cl. 303—22 R **4 Claims**



1. A load-dependent brake force governor for motor vehicle brake systems, having a governor valve arranged to monitor a passageway for a brake medium, said governor valve connected to a control piston, further wherein said control piston and said governor valve are connected to a vehicle axle by an actuation linkage, characterized in that a signal transducer for producing a load-dependent signal is associated with a housing of the brake force governor, an actuation shaft which is rotatable in accordance with load via a lever connected to said vehicle axle, said actuation shaft provided with a cam, and said cam is provided with means for actuating said signal transducer.

4,597,611

ACTUATOR FOR ANTISKID DEVICE OF VEHICLE

Takumi Nishimura, Chiryu, and Hirochika Shibata, Kariya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 31, 1984, Ser. No. 646,118

Claims priority, application Japan, Sep. 29, 1983, 58-150861[U]

Int. Cl.[4] B60T *8/02*

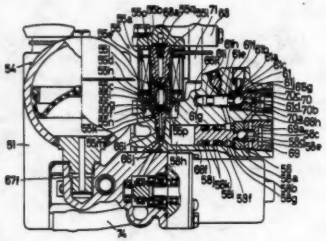
U.S. Cl. 303—116 **4 Claims**

1. An actuator adapted to be used with the antiskid device of a vehicle utilizing a power unit, the actuator comprising:

a plurality of cutoff valves capable of dividing each of the brake lines connecting the brake master cylinder of the vehicle to the wheel brake cylinders into first and second hydraulic fluid passages wherein said first passage communicates with the brake master cylinder and said second

passage communicates with at least one of said wheel brake cylinders;

a plurality of pistons which are advanced by the hydraulic fluid in the hydraulic fluid passages communicating with the wheel cylinders and are withdrawn by a first hydraulic pressure generated by said power unit to close and open said cutoff valves, said pistons also acting to increase and decrease the volume in each hydraulic fluid passage communicating with the wheel brake cylinders, and said first hydraulic pressure being transmitted through the brake fluid;



an accumulator for storing a second hydraulic pressure exceeding a maximum hydraulic pressure of the brake fluid which nearly locks the wheels;

a high-pressure pump constituting said power unit and acting to force said first hydraulic pressure into the accumulator;

an electric motor for driving the high-pressure pump;

a plurality of cylinders within which said pistons are fitted, each of the cylinders and pistons having the form of a cylinder; and

a plurality of seals respectively attached to an outer periphery of said pistons.

4,597,612

DEVICE FOR PREVENTING AN ENDLESS TRACK VEHICLE FROM DAMAGING A PAVED ROAD SURFACE

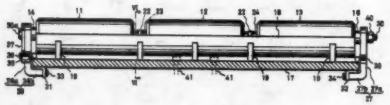
Michikazu Kaizaki, 145-1, Asano, Yabu-Cho, Yabu-gun, Hyogo-ken, Japan

Filed Feb. 5, 1985, Ser. No. 698,455

Claims priority, application Japan, Feb. 14, 1984, 59-20131[U]

Int. Cl.[4] B62D *55/28*

U.S. Cl. 305—51 **3 Claims**



1. An attachment to be fit in a groove in an endless track vehicle shoe-plate for preventing the vehicle from damaging a paved road surface, comprising a bolt having an effective length a little greater than the width of said shoe-plate, a tightening nut to be fit to said bolt, a plurality of rubber bobbins each having a reinforcing steel pipe core in which said bolt can be inserted, a pair of L-shaped fixture members each having a hole for said bolt formed in one leg thereof, a trough-like receptacle having an inner surface whose curvature is substantially equal to that of the outer surface of said rubber bobbins and including a plurality of support legs each having a contour conforming to the contour of said groove in the shoe-plate, one of said fixture member, said rubber bobbins and the other of said fixture members being fit on said bolt in this order, said nut being tightened, said rubber bobbins being contacted with the inner surface of said receptacle, and said shoe-plate being placed between said support legs of said receptacle and the other legs of said fixture members.

4,597,613

ELECTROMAGNETIC BEARING

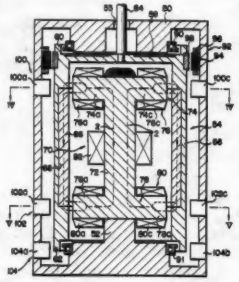
Hajime Sudo, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 14, 1984, Ser. No. 650,497

Claims priority, application Japan, Sep. 30, 1983, 58-182729

Int. Cl.[4] F16C *39/06*

U.S. Cl. 308—10 **14 Claims**



1. An electromagnetic bearing comprising:

magnetic supporting means including an elongated yoke, first and second groups of magnetic poles on the yoke defining an axis spaced along the longitudinal direction of the yoke, each member of said group including a plurality of magnetic poles protruding from the yoke perpendicular to the longitudinal direction of the yoke, first and second groups of coils including a plurality of first and second coils wound around the first and second groups of magnetic poles, each of said coils being adapted to produce magnetic flux along the protruding direction of each corresponding pole, and a third coil for producing magnetic flux along the longitudinal direction of the yoke; and

a supported body including a magnetic coupling member formed of a ferromagnetic material, said magnetic coupling member extending along the longitudinal direction of the yoke and having end portions aligned individually with the first and second groups of magnetic poles, whereby magnetic fluxes are formed between the magnetic poles and the magnetic coupling member by the first and second coils and enter and leave the magnetic coupling member in the direction substantially perpendicular to the longitudinal direction of the magnetic coupling member, and magnetic fluxes are formed between the magnetic poles and the magnetic coupling member by the third coil and enter and leave the magnetic coupling member substantially at right angles to the end faces of the magnetic coupling member.

4,597,614

STORAGE/DISPENSER RACK FOR RECTANGULAR ARTICLES

Steven G. Alexander, 27850 Dartmouth, Madison Heights, Mich. 48071

Filed Mar. 1, 1985, Ser. No. 707,158

Int. Cl.[4] A47F *3/02*; B65G *59/00*; B65D *25/54*

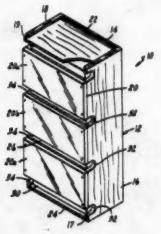
U.S. Cl. 312—42 **7 Claims**

1. A storage/dispenser rack for rectangular articles having predetermined substantially identical width, depth and thickness dimensions, with the thickness dimension being less than the width and depth dimensions, said rack comprising

a rectangular enclosure having a back wall, spaced sidewalls projecting from said back wall, a front wall bridging said

sidewalls and spaced from said back wall, and opposed end walls, said enclosure having an open internal volume bounded by said walls and an axis parallel to said front, back and side walls, spacing between said front, back and side walls corresponding to the width and depth dimensions of an article and spacing between said end walls being sufficient to permit stacking of a plurality of said articles within said enclosure with thickness dimensions parallel to said axis,

a plurality of at least three rectangular openings extending laterally of said axis across said front wall between said



sidewalls, each said opening having a width parallel to said axis greater than said predetermined article thickness but less than twice said thickness, said openings being spaced from each other between said end walls by integral multiples of said predetermined thickness, one said opening being positioned adjacent to each said end wall and a third said opening being spaced from said end walls between said end-wall-adjacent openings, and

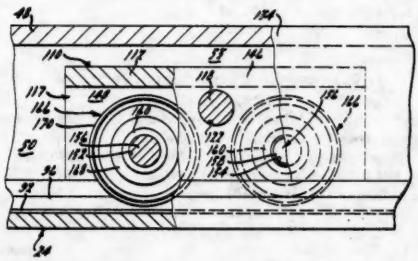
a plurality of recesses in each said sidewall disposed in opposed pairs aligned with said openings and being dimensioned to permit grasping and withdrawal of an article through said openings.

4,597,615

STORAGE SYSTEM

Arthur Steger, Ferndale, Mich., assignor to Andersen & Associates, Inc., Farmington Hills, Mich.

Filed Apr. 4, 1984, Ser. No. 596,729
Int. Cl.[4] A47B 53/02
U.S. Cl. 312—201 **23 Claims**



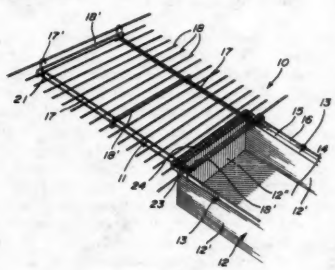
1. A moveable storage system comprising at least one storage unit, a plurality of relatively flexible track members mounted upon and conformable to a relatively irregular surface extending between spaced apart locations, a base structure being formed by a plurality of longitudinal and lateral support members, each member having two spaced apart depending portions, said base structure supporting each said storage unit and having a plurality of roller members supported by and operable to be guided by said track members to facilitate movement of said storage unit between said spaced apart locations, at least one of said roller members comprising an articulated wheel assembly associated with one of said track members, an articulation shaft defining a pivot axis extending substantially normally of the direction of travel along that track member, a carriage member supported by said articulation shaft for movement and said carriage being free to move axially along said articulation shaft between said depending portions, at least two rotatable spaced apart wheel assemblies operable to be supported and guided by that track member, said carriage member comprising an elongated generally U-shaped wheel housing having a pair of spaced apart depending sidewalls defining an elongated channel within which said wheel assemblies are supported for rotation, and said wheel housing extending beyond said wheel assemblies such that said wheel housing limits the angular movement of said carriage, with respect to said base structure member.

4,597,616

DRAWER-LIKE CONTAINER ASSEMBLY

Antoine Trubiano, Pointe aux Trembles, Canada, assignor to Carl-All Inc., Quebec, Canada

Filed Oct. 30, 1984, Ser. No. 666,439
Int. Cl.[4] A47F 5/08
U.S. Cl. 312—246 **5 Claims**

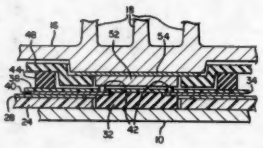


1. A drawer-like container assembly comprising a wire support frame for slidingly supporting a rectangular open-ended container having opposed near and front walls and two side walls, said side walls each having a flange connected to and protruding outwardly of said container in a peripheral region of said open end. said frame having a pair of spaced elongated container engaging channels for slidingly receiving said flange on each respective side of said container, a gate member hinged to a front end of said frame above said elongated channels, said gate member being positionable internally of said container and having a free abutting end to abut a rear portion of said end wall for retaining said container in said frame and limiting outward sliding displacement of said container when slidingly engaged by said frame, said retention means being also positionable outwardly of said container to permit removal of said container from said frame, and stop means to abut said container to limit inward sliding displacement thereof in said support frame, said support frame having a wire frame comprising at least two spaced apart longitudinal wire members and a plurality of transverse wire members connected to said longitudinal wire members to define a wire wall; at least two of said transverse wire members near the ends of said frame having downwardly extending U-shaped ends facing inwardly under said top wall to define said elongated channel, a straight wire connected near the free end of said U-shaped ends to constitute a support surface of said channels, a rear one of said U-shaped ends having a longer free end portion than said other U-shaped ends to define an extension portion to constitute said stop means.

4,597,617
PRESSURE INTERCONNECT PACKAGE FOR INTEGRATED CIRCUITS

Raymond S. Enochs, Hillsboro, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 19, 1984, Ser. No. 591,348
Int. Cl.[4] H01R *23/72*
U.S. Cl. 339—17 CF 12 Claims



1. An apparatus for making an electrical connection between an integrated circuit chip having a plurality of contact pads arranged in a first pattern and an etched circuit board having a plurality of conductors arranged in a second pattern, comprising:

(a) interconnecting circuit means having a plurality of conductive strips arranged to correspond to at least a portion of said second pattern, said strips terminating in contact points corresponding to at least a portion of said first pattern.

(b) means for aligning said integrated circuit chip with said interconnecting circuit means and said etched circuit board with said interconnecting circuit means; and

(c) means for applying substantially uniform pressure to said interconnecting circuit means, said integrated circuit chip, and said circuit board, thereby forcing said contact pads into electrical contact with said contact points and said conductive strips into electrical contact with said conductors without creating a direct physical bond between said contact pads and said contact points or between said conductive strips and said conductors, the pressure-applying means comprising a base member and a top member for receiving the circuit board, the integrated circuit chip and the interconnecting circuit means therebetween, with the interconnecting circuit means disposed between the circuit board and the integrated circuit chip, and the pressure-applying means further comprises means for locking the top member to the base member, a first resiliently compressible member positionable effectively between the circuit board and the interconnecting circuit means, and a second resiliently compressible member positionable effectively between the top member and the interconnecting circuit means, whereby upon locking of the top member to the base member the first and second resiliently compressible members are compressed and the first resiliently compressible member forces said contact pads into electrical contact with said contact points and the second resiliently compressible member forces said conductive strips into electrical contact with said conductors.

4,597,618
STABILIZED ARRAY PIN CONNECTOR

William A. Reimer, Wheaton, Ill., assignor to GTE Automatic Electric Inc., Northlake, Ill.

Filed Dec. 19, 1983, Ser. No. 562,636
The portion of the term of this patent subsequent to Jul. 23, 2002, has been disclaimed.
Int. Cl.[4] H01R *13/621*
U.S. Cl. 339—65 1 Claim

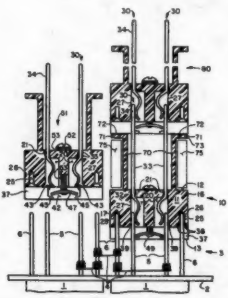
1. In combination:

means supporting a plurality of rigid terminating pins, each extending in the same direction from said supporting means and each including an upper end, said terminating pins including a group of contact terminating pins surrounded by a group of positioning terminating pins; and a connector comprising:

a base having a lower surface, an upper surface, at least two opposite ends and at least two opposite side surfaces,

a plurality of positioning pins apertures formed in said base lower surface adjacent to each of said base sides and ends, said positioning pin apertures each engaging a corresponding one of said positioning terminating pins and each including a blocked upper end, said upper ends of said positioning terminating pins each in contact with a corresponding one of said positioning pin aperture blocked upper ends,

a plurality of contact pin apertures each extending between



said base lower and upper surfaces, surrounded by said positioning pin apertures and each engaged with a corresponding one of said contact terminating pins,

at least one channel formed in said base lower surface and at least partly intersecting at least one of said contact pin apertures, said channel extending from an end of said base inward and terminating in a wall,

an electrically nonconductive lock member positioned within said channel, said lock member operated to lock said engaged contact terminating pin within said intersected contact pin aperture, said positioning pin aperture blocked upper ends cooperating with said positioning terminating pins engaged therewith and said locked contact terminating pin to inhibit movement between said supporting means and said connector.

4,597,619
LOW INSERTION FORCE CONNECTION ARRANGEMENT

William A. Reimer, Wheaton, Ill., assignor to GTE Communication Systems Corporation, Northlake, Ill.

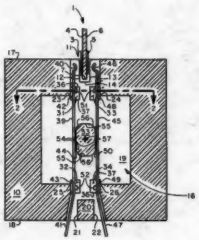
Continuation-in-part of Ser. No. 527,637, Aug. 29, 1983, Pat. No. 4,504,101. This application Dec. 10, 1984, Ser. No. 679,794
The portion of the term of this patent subsequent to Mar. 12, 2002, has been disclaimed.
Int. Cl.[4] H01R *9/09*
U.S. Cl. 339—75 MP 2 Claims

1. In combination, a first printed wiring board including a plurality of terminals, and low insertion force arrangement for establishing a connection to said printed wiring board, said arrangement comprising:

a plurality of connection springs, each spring including a contact, a first and a second pivot point, a connection spring terminal, and an actuator engaging areas, one of said pivot points located between said contact and said actuator engaging area, said contact engageably positioned relative to a corresponding one of said printed wiring board terminals and said connection spring terminal permitting connection to external points;

a first and second fulcrum each positioned to engage each of said springs at a corresponding one of said pivot points;

an actuator located proximate to each of said springs at said actuator engaging area, said actuator positioned in a first position relative to said spring to pivot said spring and engage said contact with said printed wiring board terminal, and positioned in a second position relative to said



spring to pivot said spring and disengage said contact from said printed wiring board terminal; and

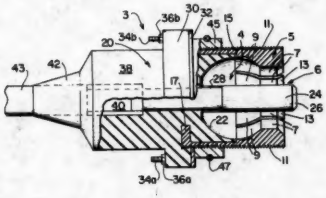
a connector body including a printed wiring board receiving cavity and a plurality of spring receiving cavities, said printed wiring board positioned within said printed wiring board receiving cavity and said connection springs positioned within corresponding ones of said spring receiving cavities.

4,597,620

ELECTRICAL CONNECTOR AND METHOD OF USING IT

Melvin Lindner, Huntington, and Ronald A. Mackey, Saville, both of N.Y., assignors to J. B. Nottingham & Co., Inc., Central Islip, N.Y.

Filed Feb. 13, 1984, Ser. No. 579,531
Int. Cl.[4] H01R *13/639*
U.S. Cl. 339—89 R **10 Claims**



1. An electrical connector assembly formed from a pair of mateable electrical connectors which may be locked together mechanically and electrically without the application of torsional forces to either connector, comprising:

(a) a first connector having a collet with a resiliently expandable mouth and a substantially spherical interior which surrounds a first elongated conductive member;

(b) a second connector having a substantially spherical member which is complementary in shape, and capturable within, the spherical interior of said collet for mechanically connecting the first and second connectors, wherein said spherical member includes an elongated cavity having a mouth for receiving the first elongated conductive member, and which houses a second elongated conductive member which mechanically and electrically connects with said first conductive member when said spherical member is inserted through the expandable mouth of the collet and captured within the spherical interior of the first connector;

(c) a sealing means for providing a water-tight seal between said first and second elongated conductive members and the mouth of said elongated cavity when said spherical member is captured within the spherical interior of the first connector and said first and second conductive members are disposed within said cavity, and

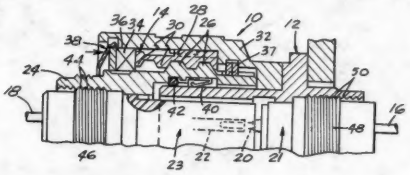
(d) a ring means which circumscribes said first connector means and which is movable to a collet-locking position around the resiliently expandable mouth of the first connector when said spherical member of said second connector is within said spherical interior of said first connector without the application of torsional forces to said first connector.

4,597,621

RESETTABLE EMERGENCY RELEASE MECHANISM

Edgar Burns, Los Angeles, Calif., assignor to Automation Industries, Inc., Greenwich, Conn.

Filed Feb. 8, 1985, Ser. No. 699,798
Int. Cl.[4] H01R *13/633*
U.S. Cl. 339—90 R **13 Claims**



1. In an electrical connector having a connector shell and a coupling ring surrounding the shell, an emergency release for securing the shell to the coupling ring, for movement when the coupling ring is rotated, and for releasing the shell from the coupling ring upon the occurence of an axial force on the shell exceeding a preselected amount, comprising:

an annular groove in the interior facing surface of the coupling ring; and

an over-the-center spring means with a radially outwardly extending flange portion, said spring means being settable to a first position of a diameter such that the flange portion is received within the annular groove and settable by an axial force exceeding a preselected amount to a second position with the flange portion removed from the annular groove.

4,597,622

ELECTRICAL CONNECTOR FOR ELECTRICAL CIRCUIT TEST PROBE AND CONNECTOR

Thomas D. Coe, Boxford, Mass., assignor to QA Technology Company, Exeter, N.H.

Filed Mar. 25, 1985, Ser. No. 715,540
Int. Cl.[4] H01R *4/24*
U.S. Cl. 339—95 R **9 Claims**

1. An electrical connector comprising:

(a) a cylindrical collet member of an electrically conductive material and having jaws at one end facing into a central bore, said member being adapted to have an electrical conductor disposed within said bore and between facing surfaces of said jaws; and

(b) a plug housing of an electrically conductive material and adapted for electrical connection to a circuit, said plug housing having a first cylindrical portion having an opening on one end for receiving said collet member and being of an internal diameter to provide a slide fit for said jaws, said first cylindrical portion being connected to a second cylindrical portion by a smoothly tapered portion, said second cylindrical portion having an internal diameter sized such that as said collet member with an electrical conductor disposed therein is slid into said second cylindrical portion through said tapered portion, said jaws are

squeezed together with a pressure to cause said jaws to bite into said conductor, the material of said collet member adjacent said jaws subsequently being plastically de-

formed to facilitate further sliding of said collet member into said plug housing to maintain the jaws in electrical connection with the conductor.

4,597,623

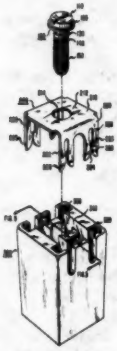
CONNECTOR ASSEMBLY

Charles L. Krumreich, Indianapolis, Ind., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 393,403, Jun. 29, 1982, abandoned. This application Jun. 27, 1985, Ser. No. 749,133

Int. Cl.[4] H01R *9/08*

U.S. Cl. 339—97 P **4 Claims**



1. The improvement in an electrical connector assembly comprising; a vertical terminal screw having a flanged top head, a bottom threaded stem, a collar between said head and stem, and a reduced diameter neck between said head and collar, an insulative post having therein a vertical passageway extending thereinto from the top thereof and including an upper part for receiving said collar and a lower part constituting a bore formed in said post to receive and threadingly engage with said stem, said post having formed therein two channels extending longitudinally therethrough on laterally opposite sides of said passageway for accommodation in such channels of respective electrical conductors, and said post also having formed therein two vertical slots extending downward from the top of said post and extending laterally therein on longitudinally opposite sides of said passageway so that each of said slots transects both said channels, and an electroconductive contact having a horizontal base with a central opening containing said screw's neck and of smaller diameter than said screw's head and collar so that said contact is retained in assembled relation with said screw, and sid contact also having two slotted beam portions which extend from longitudinally opposite ends of said base downward into respective ones of said slots, and each of which beam portions has furcations at its bottom for making electrical contact in the slot receiving that portion with electrical conductors in such channels; said improvement comprising the features that: (a) the bottoms of said channels are vertically above said bore in said post so as to be disposed on laterally opposite sides of, and within the vertical extent in said post occupied by, said upper part of said passageway in said post, and (b) each of said channels is laterally spaced from the centerline of said upper part of said passageway by a distance in the direction of spacing which is at least equal to the radius of said collar but is less than the sum of such radius and the thickness in such direction of the material in said post surrounding said bore.

4,597,624

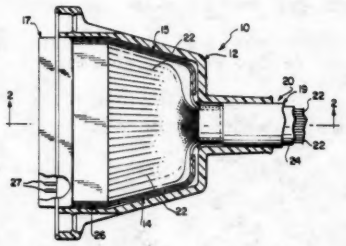
SHIELDED CONNECTOR AND METHOD OF FORMING SAME

Ronald G. Lax, Los Gatos; Robert G. Johnson, Santa Clara; Charles G. Henningsen, Portola Valley, and J. Scott Ellis, San Jose, all of Calif., assignors to Quintec Interconnect Systems, Mountain View, Calif.

Continuation of Ser. No. 374,287, May 3, 1982, Pat. No. 4,514,029. This application Mar. 29, 1985, Ser. No. 717,507

Int. Cl.[4] H01R *13/504*

U.S. Cl. 339—143 R **4 Claims**



1. In a shielded connector for a shielded cable including a cable having a plurality of insulated conductors, an outer insulating jacket enclosing the conductors and a shield layer interposed between the conductors and the jacket with the conductors and the shield layer extending past an end of the insulating jacket; and a metallic connector housing coupled to an insulated terminal block which supports terminals electrically connected to the conductors, the improvement comprising:

a pair of opposed, rigid shield members located between the connector housing and the end of the insulating jacket and receiving the insulated conductors extending past the jacket therebetween;

means for interconnecting said opposed shield members;

means for electrically connecting said shield members to the shield layer;

means for electrically connecting said shield members to the connector housing;

a unitary, preformed and self-supporting outer housing enclosing said opposed shield members, a portion of the connector housing, and a portion of the insulating jacket therein, said outer housing comprising a tube; and

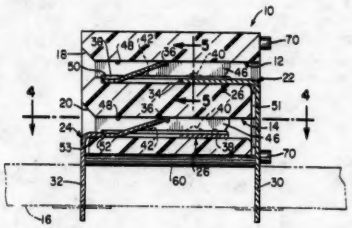
means, interposed between said outer housing and said shield members, for coupling said outer housing to said shield members to prevent axial movement of said outer housing away from said connector housing.

4,597,625

ELECTRICAL CONNECTOR

Jack Seidler, Flushing, N.Y., assignor to North American Specialties Corporation, College Point, N.Y.

Filed Jul. 25, 1984, Ser. No. 634,299
Int. Cl.[4] H01R *13/11, 13/514*
U.S. Cl. 339—176 M 7 Claims



1. A connector comprising

a unitary housing adapted to receive either a front or a rear contact, said front contact having a terminal portion extending outwardly of said housing to the front thereof when mounted in said housing, said rear contact having a terminal portion extending outwardly of said housing to the rear thereof when mounted in said housing,

said housing having

a first channel adapted to receive a mating connector pin and extending inwardly from a front entry section,

a second channel adapted to receive a contact,

said contact-receiving channel having a first portion wider than said pin-receiving channel and communicating along at least a portion of its length with said pin-receiving chanel,

said contact-receiving channel also having a second portion extending through said front entry section, said second portion being of lesser width than said first contact-receiving channel portion, and

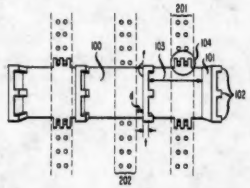
said connector further including a contact in said contact-receiving channel, said contact having a terminal portion extending outwardly of said housing through said second contact receiving channel portion.

4,597,626

KEY BLOCK ARRANGEMENT

Larry J. Gabbard, 11555 W. 78th Dr., Arvada, Colo. 80005, and Henry J. Gorenz, Jr., 7060 N. Eldridge Ct., Arvada, Colo. 80004

Filed Sep. 27, 1984, Ser. No. 654,887
Int. Cl.[4] H01R *13/64*
U.S. Cl. 339—184 M 6 Claims



1. in a circuit pack carrier having a back side which consists of backplane wiring having protruding therefrom to the front side a plurality of sets of pins which are the pin elements of pin-in-hole connectors and having top and bottom sides each of which are equipped with a plurality of card guides for aligning with said plurality of sets of pins circuit boards each of which are equipped with a connector body which is the mating segment to one of said sets of pins, a key block apparatus for preventing the insertion of any of said circuit boards equipped with a connector body of greater than a predetermined width onto a designated one of said plurality of sets of pins comprising:

base means attachable to said front side of said backplane for securing said key block to said front side of said backplane in close proximity to said designated set of pins;

block means protruding from said base means in said frontwise direction a distance greater than or equal to the height of said pin elements above said backplane for providing a predetermined aperture between said block means and said designated set of pins for only a connector body of less than said predetermined width to pass through before contacting said designated set of pins; and

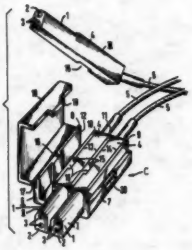
wherein said base means includes tab means having one or more slots included therein for aligning said key block apparatus on said backplane by inserting associated pins of said connector pins into said slots.

4,597,627

MULTIPLE PLUG

Arthur Wondra; Gerhard Weller, both of Erlangen, and Alfred Ulrich, Fuerth, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 230,602, Feb. 1, 1981, abandoned. This application Aug. 4, 1983, Ser. No. 485,219
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1980, 3012174
Int. Cl.[4] H01R *33/04*
U.S. Cl. 339—196 M 3 Claims



1. Apparatus connecting a plurality of individual, separate signal cables to an adapter having multiple contact means comprising individual plug heads fitted respectively at corresponding free ends of said signal cables and adapted to be connected to corresponding individual counterpieces of said multiple contact means, each respective corresponding plug head and signal cable forming an individual cable unit, said plug heads having pole portions for releasably connecting with corresponding individual counterpieces of said multiple contact means, a containment housing having bottom wall and upstanding sidewall portions defining a plurality of parallel, side-by-side chambers for separately, selectively containing said plug heads, said sidewall portions extending through said housing in the longitudinal direction, wherein each said plug head is shaped as a generally elongated bar having a head part and a back part, each said back part being generally of a rectangularly shaped cross-section for seating between adjacent sidewall portions of said chambers in tight-fit relation, said pole portions being contained in said containment housing such that said pole portions project outwardly from said containment housing, lock means for releasably securing said plug heads in said chambers including a protuberance extending transversely inward of each chamber from at least one sidewall portion thereof and a transverse recess formed on each plug

head for respectively matingly fitting said protuberances, whereby said plug heads are contained in said containment housing as a consolidated unit for simultaneous connection with said multiple contact means, pivotal cover means associated with said containment housing for closing said plug heads in said chambers, and releasable clamp means for securing said cover means closed over said chambers, such that upon releasing said clamp means and pivoting said cover means said plug heads are individually removable from said chambers and the relative position of each said cable unit is individually selectable within said containment housing for connection to said adapter.

4,597,628

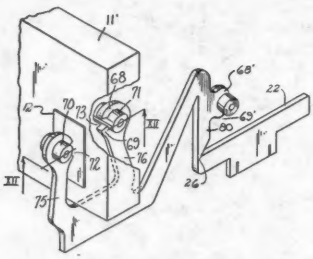
SOLDER BEARING CLIP

Jack Seidler, Flushing, N.Y., assignor to North American Specialties Corporation, Flushing, N.Y.

Continuation-in-part of Ser. No. 567,132, Dec. 30, 1983, which is a continuation-in-part of Ser. No. 402,963, Jul. 29, 1982, abandoned. This application Sep. 19, 1985, Ser. No. 778,446

Int. Cl.[4] H01R *4/02*

U.S. Cl. 339—275 T **14 Claims**



1. An edge clip for securement to a contact pad on a circuit-bearing substrate, comprising a clip body portion of sheet metal and at least one compact mass of solder, the body portion being flat and provided with a pair of integral flat contact arm elements lying in the plane of the body portion and each arm element being provided with a pair of arcuately shaped fingers adapted to engage edgewise a mass of solder.

4,597,629

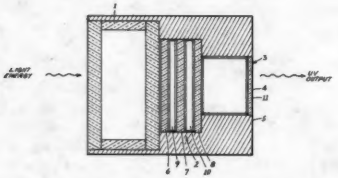
SOLAR BLIND ULTRAVIOLET FILTER

Robert J. Kraushaar, Tenafly, N.J., and Kevin B. Ward, Bayside, N.Y., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jun. 4, 1980, Ser. No. 158,419

Int. Cl.[4] G02B *5/24*

U.S. Cl. 350—1.5 **15 Claims**



1. A solar blind ultraviolet filter to pass ultraviolet light energy in a given passband and to block light energy outside of said given passband comprising:

a first cell containing chlorine gas to absorb light energy in a first region spaced from said given passband disposed coaxial of a longitudinal axis to receive light energy through an input face thereof;

a filter element including potassium iodide doped with thallium and a Cation X-glycerol solution to absorb light energy in a second region disposed between said given passband and said first region disposed along said axis and secured to an output face of said cell;

a unit containing a nickel sulphate hexahydrate crystal to absorb light energy in a third region spaced from said given passband and adjacent the higher end of said first region disposed along said axis and secured to an output face of said filter element, said unit having an output face to provide an ultraviolet energy output in said given passband for said solar blind filter; and

a black anodized aluminum shell disposed coaxial of said axis to enclose the peripheral surface of said first cell, said element and said unit.

4,597,630

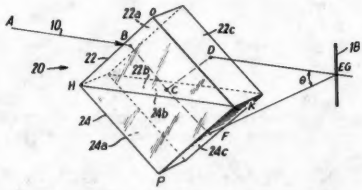
SELF-DERIVED REFERENCE BEAM HOLOGRAPHY USING A DOVE PRISM

Robert W. Brandstetter, Levittown; Otto F. Lynn, Jackson Heights; Abraham Reich, Dix Hills, all of N.Y., and Richard P. Waldo, West Hartford, Conn., assignors to Grumman Corporation, Bethpage, N.Y.

Continuation of Ser. No. 790,048, Apr. 22, 1977, abandoned. This application Jun. 4, 1979, Ser. No. 45,001

Int. Cl.[4] G03H *1/12*; G02B *27/10, 27/46*

U.S. Cl. 350—3.83 **1 Claim**



1. A system for use in recordation and recognition of signal information from such signals as acoustical waves, electromagnetic waves and like signals capable of being used to modulate light, comprising:

a source of light radiation;

receiving means for receiving desired signal information;

modulating means adapted to receive the light provided by said light radiation source, said modulating means adapted to modulate at least a portion of light from said light source in accordance with the desired signal information to be recorded or recognized;

optical means for allowing only modulated light radiation to be transmitted thereby;

beam-splitting means for splitting said modulated object beam into a signal and a corresponding self-derived reference beam, said beam-splitting means including:

a first transparent prism element having a first essentially flat incident surface, a first base surface and a first exit surface, the index of refraction of said first prism and the orientation of said first incident surface with respect to said base surface and object beam being selected to refract the object beam, when incident on said first incident surface, towards said first base surface whereat the once refracted object beam in part is reflected towards said first exit surface which is oriented to refract the reflected beam portion towards a predetermined plane to form said signal beam and in part is transmitted through said first base surface, said first prism comprising an isoselese trapezoidal dove prism having equal base angles along said first base surface; and

a second transparent prism having a second base surface abutting said first base surface and a second exit surface, said second base surface and said second exit surface

forming an angle smaller than the base angle of said first prism element, the interface of said first and second base surfaces being adapted to split the object signal beam into the reflected beam portion which is reflected towards said first exit surface and a transmitted beam portion which is transmitted into said second prism, the index of refraction of said second prism and the orientation of said second exit surface relative to said second base surface being selected to refract the transmitted beam portion towards said second exit surface which in turn refracts the transmitted beam portion towards the path of the signal beam to form said reference beam and to interfere optically with the signal beam at the predetermined plane, said first and second prisms being coupled together to form an essentially integral beam-splitting means which is virtually unaffected by mechanical vibrations; and

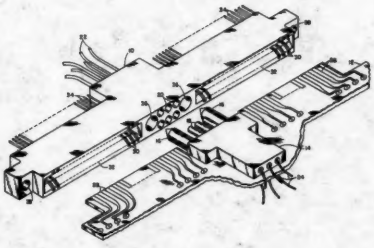
a photo-optical element positioned essentially at the location of optical interference between said signal and reference beams.

4,597,631

PRINTED CIRCUIT CARD HYBRID

Arnold Flores, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 2, 1982, Ser. No. 446,295
Int. Cl.⁴ G02B *6/36*
U.S. Cl. 350—96.20 **9 Claims**



1. A hybrid connector for fastening both electrical and light conductors to a printed circuit board which comprises:

holding means fixed as an input edge of the printed circuit board for holding in a preselected arrangement a first combination of a plurality of fiber optic contact inserts and electrical contacts, said first combination of contacts being arranged to serve as optical and electrical signal inputs for the circuitry on the printed circuit card; said holding means including a housing which is rigidly fixed to the printed circuit board, said housing containing a portion of the fiber optic inserts and holding them in said preselected arrangement; and

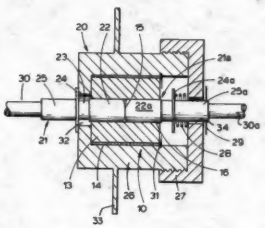
maintaining means for maintaining in a preselected arrangement a second combination of a plurality of fiber optic contact inserts and electrical contacts which connects said second combination of contacts to said first combination of contacts on the holding means, said first and second combination sets of contacts mating in a manner for transmitting electrical and optical signals through the connection, and said maintaining means making a releasable connection with the holding means.

4,597,632

TEMPERATURE SENSITIVE RELEASABLE OPTICAL CONNECTOR

Stephen R. Mallinson, Ipswich, England, assignor to British Telecommunications, London, England

Filed Nov. 25, 1983, Ser. No. 555,077
Claims priority, application United Kingdom, Nov. 26, 1982, 8233761
Int. Cl.⁴ G02B *6/38*
U.S. Cl. 350—96.21 **21 Claims**



1. An optical connector comprising:

a plug member having a plug portion and arranged to permit mounting of one or more optical components in a desired position relative to the plug portion; and

(b) a socket member including

(i) an inner clamping sleeve of shape memory effect (SME) material having a socket portion therein dimensioned to provide releasable engagement with the plug portion and arranged to grip the plug portion in a first temperature range and to release the plug portion in a second temperature range,

wherein the SME material is in its softer phase in said first temperature range and in its harder phase in said second temperature range; and

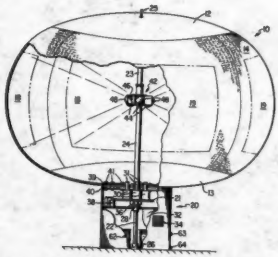
(ii) an outer compression sleeve of elastic material arranged to reinforce contraction of the clamping sleeve in said first temperature range and to be elastically deformed by expansion of the clamping sleeve in said second temperature range.

4,597,633

IMAGE RECEPTION SYSTEM

Charles H. Fussell, 3927 Rosser Sq., Dallas, Tex. 75244

Filed Feb. 1, 1985, Ser. No. 697,516
Int. Cl.⁴ G03B *21/56*
U.S. Cl. 350—125 **5 Claims**



1. An image reception system for video projection apparatus comprising:

a flexible material forming an inflatable volume enclosing said projection apparatus having a first plurality of arcuate surfaces,

said first plurality of arcuate surfaces further including a second plurality of arcuate reception surfaces having an inflated interior surface contour and orientation for receiving from said projection apparatus a video image effective for viewing from a location external to said enclosed volume, and

heater means for introducing heated air within said inflatable volume effective to establish a pressure differential across said flexible material effective to extend said first plurality of arcuate surface and inflate said inflatable volume,

wherein said heater means includes fan means for directing air about said projection apparatus to remove heat therefrom.

4,597,634

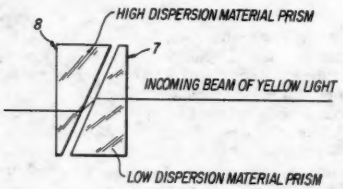
STEREOSCOPIC PROCESS AND APPARATUS

Richard A. Steenblik, Stone Mountain, Ga., assignor to Georgia Tech Research Institute, Atlanta, Ga.

Filed Jan. 5, 1984, Ser. No. 568,419

Int. Cl.[4] G02B *5/04, 5/06, 27/22*

U.S. Cl. 350—144 **10 Claims**



1. A method for producing and viewing stereoscopic images, comprising the steps of:

color coding each portion of an image to be viewed according to the desired depth appearance of said portions with respect to the remaining portions of said image;

displaying on a display means said image having each of said color coding portions; and

viewing said display means through a viewer means comprising two prisms associated with each of the left and right eye, said two prisms being placed with their bases in opposition, one of said two prisms being constructed of a low dispersion material and the other of said two prisms being constructed of high dispersion material, said two prisms being designed so that a chosen wavelength of light entering said one prism passes through both said prisms and emerges from the other of said prisms parallel to the entering chosen wavelength of light.

4,597,635

LIQUID CRYSTAL DISPLAY DEVICE AND A METHOD OF MANUFACTURING THE SAME FROM A FOLDED PLASTIC SHEET

Jun Hoshikawa, Shiojiri, Japan, assignor to Epson Corporation, Tokyo, Japan

Filed Dec. 23, 1983, Ser. No. 565,258

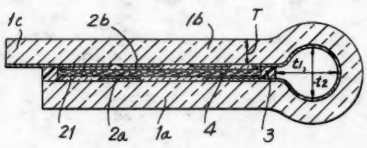
Claims priority, application Japan, Dec. 23, 1982, 57-228180; Dec. 23, 1982, 57-228181; Oct. 21, 1983, 58-197002

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—334 **30 Claims**

1. A liquid crystal display device comprising a folded substrate sheet having an upper planar portion and an opposed lower planar portion spaced apart and parallel to each other and a fold line between the planar portions, a sealing material disposed about the perimeter of the opposed portions of the substate sheet for defining a space, liquid crystal material sealed in the space, each facing portion of the substrate sheet having cooperating electrode patterns formed thereon for applying a voltage therebetween across the liquid crystal material to render selected portions visually distinguishable from the remaining material, one of said electrode patterns on one of the opposed substrate portions extending about the fold line between the substrate portions to the edge of the other substrate portion.

7. A liquid crystal display device comprising a folded substrate sheet of flexible material having two opposed, spaced apart and parallel portions and a folded portion defining a fold line therebetween, cooperating transparent electrode patterns disposed on the opposed portions and liquid crystal material disposed therebetween, the opposed surfaces of said substrate sheet treated for orientation in a single direction prior to folding to define the two opposed substrate portions, the direction of orientation on the surface of said substrate sheet being parallel to said fold line, and the direction of orientation of one parallel portion with respect to the other parallel portion being an angle of 180° plus a multiple of 360°.



23. A liquid crystal display device comprising a folded substrate sheet of flexible material having two opposed, spaced apart and parallel portions and a folded portion defining a fold line therebetween, a portion of said substrate being a polarizer, cooperating transparent electrode patterns disposed on the opposed portions and liquid crystal material disposed therebetween.

4,597,636

LIQUID CRYSTAL DISPLAY PANEL AND A PROCESS FOR THE PRODUCTION THEREOF

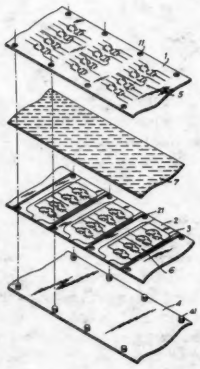
Jun Hoshikawa, Shiojiri, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Dec. 27, 1983, Ser. No. 565,546

Claims priority, application Japan, Dec. 27, 1982, 57-228926

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—334 **37 Claims**



1. A liquid crystal display panel assembly comprising:

a first elongated plastic film substrate;

at least two second plastic film substrates each of a predetermined length, said second substrates overlying said first substrate;

an electrode pattern disposed on the facing surfaces of each of said first and second substrates; and

sealing means for sealing each said second substrate to said first substrate.

19. A process for the production of a liquid crystal display panel comprising at least two plastic substrates comprising:

forming an electrode pattern on at least one surface of a first elongated plastic film to define a first substrate;

forming an electrode pattern on a second plastic film;

cutting said second plastic film to at least two sections each of a predetermined length to define at least two second substrates;

joining each of said second substrates to said first substrate with the respective electrode patterns in facing relation; and

inserting a liquid crystal material between each said second substrates and said first substrate, to form at least two liquid crystal display panels.

4,597,637

COLOR OPTICAL PRINTER HEAD HAVING A LIQUID CRYSTAL LAYER

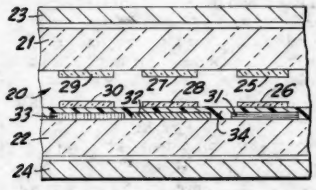
Takahiro Ohta, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 26, 1984, Ser. No. 573,944

Claims priority, application Japan, Jan. 28, 1983, 58-11407

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—339 F **13 Claims**



1. A color optical printer head comprising: a liquid crystal, two glass substrates, said liquid crystal being sealed between said glass substrates, polarizing plates mounted on outer surfaces of said glass substrates, liquid crystal shutter arrays having plural transparent electrodes arranged in an opposing manner on said two glass substrates on the side contacting said liquid crystal, and color filter layers mounted at locations where transparent electrodes are formed to act as an optical shutter when a predetermined voltage is selectively applied between said opposing transparent electrodes, said color filter layers being of different colors corresponding to the colors to be resolved and being interposed between one of said glass substrates and the transparent electrodes on said one glass substrate.

10. A color optical printer head comprising: a liquid crystal, two glass substrates, said liquid crystal being sealed between said glass substrates, polarizing plates mounted on outer surfaces of said glass substrates, liquid crystal shutter arrays having plural transparent electrodes arranged in an opposing manner on said two glass substrates on the side contacting said liquid crystal, and color filter layers mounted at locations where transparent electrodes are formed to act as an optical shutter when a predetermined voltage is selectively applied between said opposing transparent electrodes, said color filter layers being of different colors corresponding to the colors to be resolved and being interposed between one of said glass substrates and the transparent electrodes on said one glass substrate, said color filter layer comprising colored resin layers or laminations thereof, and a transparent layer coating said layers or laminations, so as to make the distance between opposing electrodes uniform over the whole surface of the shutter arrays, said transparent layer being a layer of photosensitive resin.

4,597,638

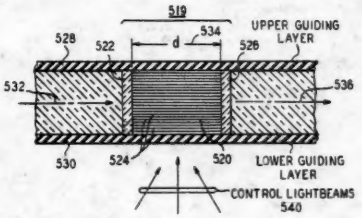
NONLINEAR OPTICAL APPARATUS

Daniel S. Chemla, Rumson; David A. B. Miller, Lincroft, and Peter W. Smith, Colts Neck, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 470,722, Feb. 28, 1983, abandoned. This application Dec. 30, 1983, Ser. No. 566,968

Int. Cl.[4] G02F *1/015*

U.S. Cl. 350—354 **20 Claims**



1. A nonlinear optical apparatus comprising:

a multiple layer heterostructure having first and second material layers having first and second bandgaps, respectively, and a semiconductor layer having a third bandgap and being positioned between said material layers, the bottom of the conduction band of said semiconductor layer being below the bottom of the conduction bands of said material layers, and the top of the valence bands of said semiconductor layer being above the tops of the valence bands of said material layers, the thickness of said semiconductor layer being sufficient for carrier confinement effects within said semiconductor layer to influence the optical properties of said multiple layer heterostructure, and said multiple layer heterostructure being such that exciton absorption and interband absorption are resolved at room temperature;

means for illuminating said multiple layer heterostructure with light photons having an optical frequency capable of causing absorption transitions between energy levels, said energy levels being influenced by said carrier confinement effects; and

means for varying an illumination intensity within said multiple layer heterostructure in order to vary an optical absorption and an index of refraction of said multiple layer heterostructure for said light photons.

4,597,639

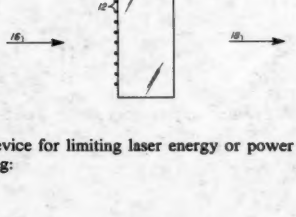
DIELECTRIC AIR-INTERFACE PLASMA OPTICAL POWER LIMITER

Steven C. Seitel, and C. Denton Marrs, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 7, 1984, Ser. No. 607,981

Int. Cl.[4] G02F *1/00*

U.S. Cl. 350—363 **8 Claims**



1. A device for limiting laser energy or power transmittal comprising:

a dielectric plate in the path of received laser energy, one surface of said dielectric plate being exposed to the atmosphere; and

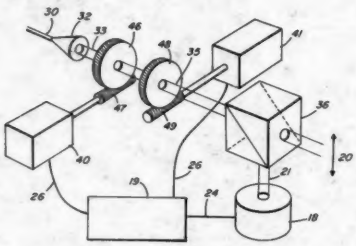
a plurality of plasma initiation sites applied to said exposed surface, said sites being particles chosen from the group consisting of

sodium fluoride, lead fluoride, lanthanum hexaboride, silicon, or any combination thereof.

4,597,640
OPTICAL POLARIZATION RESTORATION APPARATUS

Carl F. Buhrer, Framingham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 16, 1984, Ser. No. 672,035
Int. Cl.[4] G02B *27/28*
U.S. Cl. 350—405 **10 Claims**



1. Apparatus for restoring the polarization state of light emerging from an optical fiber comprising

means for coupling to said fiber for receiving light therefrom and focusing same into a parallel beam that has a polarization state that is in general elliptically polarized with an arbitrary ellipticity and orientation of its major axis;

compensating means for converting the generally elliptically polarized beam to a linear polarized beam;

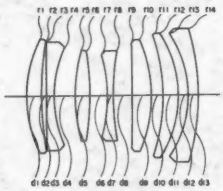
polarization beam splitting means coupled to the converted beam, from said compensating means, for causing light at one linear polarization state to traverse a first path as an output beam, and for causing light at a second linear polarized state to traverse a second path, said second polarized state being orthogonal to said first polarized state; and

means responsive to light traversing said second path for controlling said compensating means.

4,597,641
VARIABLE-POWER COPYING LENS

Yasunori Arai, Saitama, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 31, 1984, Ser. No. 646,700
Claims priority, application Japan, Sep. 8, 1983, 58-165616
Int. Cl.[4] G02B *9/64, 15/14*
U.S. Cl. 350—425 **6 Claims**



1. A variable-power copying lens including, successively in order from an object, a first lens group having a positive focal length and a second lens group having a negative focal length, said first and second lens groups being movable in their entirety while varying an interval therebetween to keep constant the distance between an object surface and an image-focusing surface, characterized in that said first lens group comprises a first positive lens, a second negative lens, a third positive lens, a fourth negative lens, and a fifth positive lens, and said second lens group comprises a sixth positive-meniscus lens having a convex surface facing an image and a seventh negative-meniscus lens having a convex surface facing the image, said variable-power copying lens meeting the following conditions:

$$0.60 < \frac{f_I}{f_{max}} < 0.75 \quad (1)$$

$$0.20 < \frac{f_3}{f_I} < 0.70 \quad (2)$$

$$0.25 < \frac{f_6}{|f_{II}|} < 0.50 \quad (3)$$

$$0.02 < \frac{N_1 + N_3 + N_5}{3} - \frac{N_2 + N_4}{2} < 0.12 \quad (4)$$

$$6 < \frac{\nu_1 + \nu_3 + \nu_5}{3} - \frac{\nu_2 + \nu_4}{2} < 18 \quad (5)$$

$$0.03 < N_7 - N_6 < 0.16 \quad (6)$$

$$0 < \nu_7 - \nu_6 < 10 \quad (7)$$

where

f_I: the focal length of the first positive lens group;

f_{II}: the focal length of the second negative lens group;

f_{max}: the focal length of the entire lens system at 1.00×;

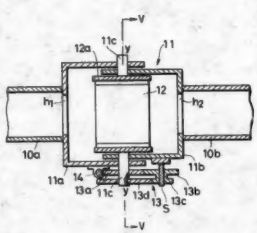
f_i: the focal length of the ith lens from the object;

N_i, ν_i: the refractive index at e line and Abbe number of the ith lens from the object.

4,597,642
ARTICULATE JOINT IN LASER PROCESSING MACHINES

Yuzuru Daigou, Niigata, and Takeo Yagi, Kanagawa, both of Japan, assignors to Niigata Engineering Co., Ltd., Tokyo, Japan

Filed May 23, 1983, Ser. No. 497,306
Claims priority, application Japan, Dec. 20, 1982, 57-223401
Int. Cl.[4] G02B *26/08*
U.S. Cl. 350—486 **6 Claims**



1. An articulate joint for use in a laser processing machine, comprising:

a hinge comprising first and second members and hinge pin means interconnecting said first and second members;

a first and second hollow arms interconnected by said hinge for passage therethrough of a laser beam said first and second hollow arms being freely bendable in a single plane;

a mirror supported to said hinge pin means; and

means for mounting said mirror in said hinge so that said mirror is angularly movable in response to relative angular movement of said first and second arms through an angle which is one-half of an angle of a relative angular

movement of said first and second arms for reflecting said laser beam coming from said first arm into said second arm, said mounting means comprising a planetary gear mechanism for angularly moving said mirror in response to said relative angular movement of said first and second hollow arms,

said planetary gear mechanism comprising:

a first gear supported on an outer surface of said first member and being rotatable relative to said hinge pin means;

a second gear rotatably mounted on a shaft fixed to an outer surface of said second member, said second gear being in mesh with said first gear;

a third gear integrally formed with said second gear and rotatably mounted on said fixed shaft;

a fourth gear in mesh with said third gear, said fourth gear being mounted on said hinge pin means; and

a worm rotatably supported on said first member, said first gear being in mesh with said worm.

4,597,643

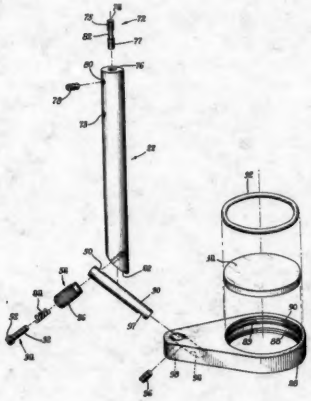
PIVOTABLE FILTER HOLDER FOR MICROSCOPES

T. Charles Podvin, Poway, and Peter J. Van Benschoten, Rancho Santa Fe, both of Calif., assignors to The Micromanipulator Microscope Company, Inc., Escondido, Calif.

Filed Oct. 4, 1983, Ser. No. 538,773

Int. Cl.[4] G02B *7/00;* **E05D** *11/08, 15/00*

U.S. Cl. 350—507 **17 Claims**



1. In combination,

a microscope having an elongated body,

eyepiece means at one end of said body,

an objective at the other end of said body,

a filter holder means for holding a filter, and

means for mounting said filter holder means to said body including a vertically extending post fixed to said microscope,

said mounting means including an inclined portion inclined to the vertical post and pivotally mounted with respect to the post to pivot between a downwardly and an upwardly inclined position,

said filter holder being carried by said inclined portion between a first position in alignment with said objective to bring the filter into a generally horizontal plane and a second stowed position in which the filter holder means extends vertically alongside said post and in which the inclined portion is in its upwardly inclined position so that said filter holder means in its stowed position does not interfere with a technician performing manipulations in front of said objective.

4,597,644

INCLINABLE MICROSCOPE BODY

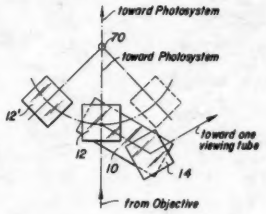
Klaus P. Schindl, Vienna, Austria, assignor to C. Reichert Optische Werke AG, Vienna, Austria

Filed Sep. 21, 1984, Ser. No. 652,796

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1983, 3334691

Int. Cl.[4] G02B *21/18, 21/20*

U.S. Cl. 350—511 **4 Claims**



1. A microscope having a housing, an inclinable eyepiece assembly, vertical observation axis, and an optical system for delivering all light from the observation axis to the eyepiece or alternatively some to the eyepiece and some to a photographic system, which comprises

a holder mounted in said housing, said holder being selectively movable between first and second positions,

a first optical means carried by said holder, said first optical means being adapted to divert all light from the vertical observation axis to a stationary horizontal axis when said holder is in said first position;

a second optical means carried by said holder, said second optical means being adapted to divert some light from the vertical observation axis to said stationary horizontal axis when said holder is in said second position and permit the remaining light to pass to the photographic system;

an optical bridge for receiving light on said stationary horizontal axis, said optical bridge being pivotably connected to said housing for rotation about a pivot axis coincident with said stationary horizontal said optical bridge exiting light along a movable horizontal axis, said movable horizontal axis being spaced from and parallel to said stationary axis, and

a pivotable optical means for diverting light received along the movable horizontal axis toward the eyepiece,

whereby all light is diverted toward the eyepiece, when the holder is in the first position and, when the holder is in the second position, some light is diverted toward the eyepiece.

4,597,645

CONDENSER LENS SYSTEM FOR MICROSCOPES

Klaus Freiberg, 52, Buttstädter Strasse, Niederrossla, and Hans Müller, 19, Bernhard-Schultze-Strasse, 6900 Jena, both of German Democratic Rep.

Filed Mar. 24, 1982, Ser. No. 353,958

Claims priority, application German Democratic Rep., May 28, 1981, 230359

Int. Cl.[4] G02B *21/06*

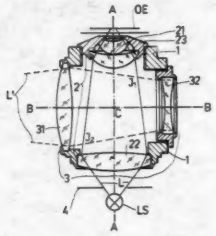
U.S. Cl. 350—526 **1 Claim**

1. A condenser lens system comprising in a lens mount,

at least a first and a second condenser lens, said first condenser lens having a first optical axis, said second condenser lens being constituted of a condenser head and a lens member in spaced relation including a first interspace, said second condenser lens being constituted of a first lens and a second lens at spaced relation including a second optical interspace, said first interspace and said second interspace being substantially coincident, said first optical and said second optical axis intersecting in the interspaces and defining a plane,

means for rotating said lens system about an axis of rotation,

said means for rotating said lens system being symmetrically provided at said lens mount about said axis of rotation, said axis of rotation intersecting said point of intersection at right angles to said plane,



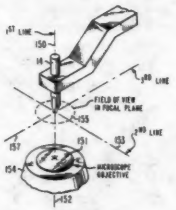
seating means being provided for seating said means for rotation.

4,597,646

APPARATUS FOR POSITIONING A STYLUS

David W. Fairbanks, Middlesex County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 1, 1983, Ser. No. 556,934
Int. Cl.[4] G02B *21/26*
U.S. Cl. 350—529 **8 Claims**



1. Apparatus for positioning a point of a stylus within the field of view and at the focal point of an optical microscope wherein said stylus includes a pair of bevelled surface converging in a direction toward said point and is carried by a stylus holder, said apparatus comprising:

(a) means for positioning said stylus holder with respect to said microscope, said means including a frame;

(b) guide means for positioning said point of said stylus within the field of view and at the focal point of said microscope upon engagement with a portion of said stylus other than said point comprising:

(1) locating block means for positioning said point of said stylus along a first line which is substantially parallel to the optical axis of said microscope and along a second line which is perpendicular to said first line and substantially coincident with the focal plane of said microscope comprising a first contact surface and a second contact surface each of which is arranged to contact a different one of said pair of bevelled surfaces of said stylus at points on opposite sides of said thire line; and

(2) locating rod means for positioning said point of said stylus along a third line arranged orthogonal to said first and second lines wherein said second and third lines intersect within the field of view of said microscope;

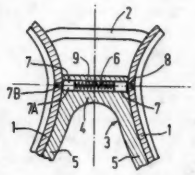
(c) actuating means for effecting said engagement of said portion of said stylus with said guide means comprising an actuating arm having a first end pivotally attached to said frame and a second end opposite said first end having a stylus actuating member attached thereto, said actuating arm arranged so that pivotal movement thereof in selected directions selectively causes said stylus to undergo first and second movements wherein said stylus engages said guide menas upon selection of said first movement and disengages said guide means upon selection of said second movement.

4,597,647

NASAL EQUIPMENT FOR SPECTACLE FRAME AND CORRESPONDING SPECTACLE FRAME

Michel Pass, Saint Mihiel, France, assignor to Essilor International (Compagnie Generale d'Optique), Creteil, France

Filed Jul. 19, 1984, Ser. No. 632,537
Claims priority, application France, Aug. 5, 1983, 83 12971
Int. Cl.[4] G02C *5/02, 5/12*
U.S. Cl. 351—133 **8 Claims**



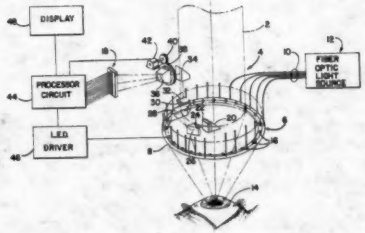
1. Nasal equipment for a spectacle frame, comprising a single piece including a central bar and two lateral pads extending from said central bar, each lateral pad intedned to interlock on a corresponding eyewire of the frame, the central bar being provided with at least one first recess, and at least one male interlocking element disposed in said at least one first recess and means for biasing said at least one male interlocking element into a second recess provided in each eyewire of the frame to lock said nasal equipment to said spectacle frame.

4,597,648

KERATOMETER

Steven E. Feldon, San Marino; Barry G. Broome, Glendora, and David A. Wallace, Hermosa Beach, all of Calif., assignors to Keratometer Research and Development, Hermosa Beach, Calif.

Filed Apr. 1, 1983, Ser. No. 481,286
Int. Cl.[4] A61B *3/10*
U.S. Cl. 351—212 **16 Claims**



1. A keratometer instrument capable of measuring keratometric values of an eye comprising:

means for creating a radiating object source of a known dimension for reflection of only one Purkinje image from the surface of an eye;

photoelectric means for receiving the reflected image and converting it into electrical signals indicative of the size of the image;

means for determining from the electrical signals if the

image is in focus and providing an enabling signal when in focus; and

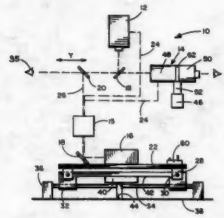
means for generating keratometric values from the electrical signals of image size when the enabling signal indicates an in focus condition, whereby the operator is not required to adjust the instrument and has constant and current keratometric values available.

4,597,649

INFORMATION DISPLAY APPARATUS FOR OPHTHALMIC SLIT LAMPS

James R. Swaniger, Costa Mesa, Calif.; Roger F. Steinert, and Carmen A. Puliafito, both of Boston, Mass., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Oct. 28, 1983, Ser. No. 546,501
Int. Cl.[4] A61B *3/10*
U.S. Cl. 351—214 **7 Claims**



1. Apparatus for displaying position information in optical instruments, comprising:

(a) an optical instrument including ocular assembly means for observation of the image of an object;

(b) coordinate table means for positioning said instrument in the directions of coordinate axes with respect to said object;

(c) micrometer means including displacement sensing means associated with said coordinate table means and indicating means associated with said instrument for producing data representative of the displacement of said coordinate table means in the direction of at least one of said coordinate axes; and

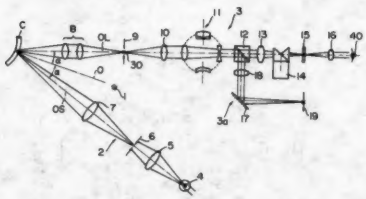
(d) display optic means for making an image of said indicator means visible along the periphery of said observed image during said observation.

4,597,650

SPECULAR MICROSCOPE

Hisakazu Yoshino, and Kazutoshi Takagi, both of Tokyo, Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed May 13, 1983, Ser. No. 494,190
Claims priority, application Japan, May 19, 1982, 57-84387
Int. Cl.[4] A61B *3/10*
U.S. Cl. 351—214 **5 Claims**



1. A specular microscope comprising an illumination optical system and an observation optical system,

said illumination optical system including a light source, a substantially straight line slit aperture for passing a part of light beams radiated from said light source and a projecting lens for forming an image of said slit aperture, said light source, said slit aperture and said projecting lens being arranged in this order along an optical axis;

said observation optical system including an objective lens system for forming an image at an intermediate image-forming point, an image-forming optical system for forming an observing image from the image in said intermediate image-forming point, and an ocular optical system for observing the images;

said observation optical system having an optical axis intersecting at an angle the optical axis of said illumination optical system at the image of said alit aperture; and

light intercepting means provided at said intermediate image-forming point and including substantially straight line main aperture means disposed on the optical axis of said observation optical system, and alignment aperture means disposed adjacent said main aperture means comprising substantially straight line apertures extending transverse to the substantially straight line main aperture and offset from the optical axis of said observation optical system; the main aperture being positioned to intercept the light reflected from the cornea and to pass light reflected from the endothelial cells, and the alignment aperture means being positioned to partially transmit light reflected from the cornea;

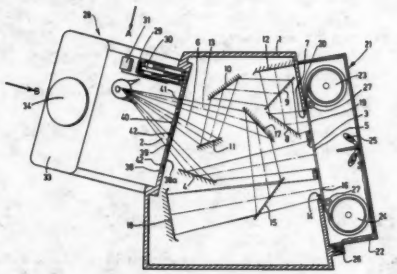
whereby when the specular microscope is positioned so that an image of said slit aperture of said illumination optical system is formed at an endothelial cell layer of an eye to be examined, an image of the endothelial cell layer is formed at said main aperture means of said light intercepting means and light reflected by a corneal surface of the eye to be examined is partially transmitted through said alignment aperture means and is substantially intercepted by the said light intercepting means.

4,597,651

APPARATUS FOR THE DETECTION OF EYE SIGHT DEFECTS AND CASSETTE FOR THE OPERATION OF SUCH AN APPARATUS

Christine Capo-Gual, Sevran; Luc Delattre, Pont Sainte Maxence, and Jean-Claude Hennequin, Lizy sur Ourcq, all of France, assignors to Essilor International (Compagnie Generale d'Optique), Creteil, France

Filed Aug. 11, 1983, Ser. No. 522,230
Claims priority, application France, Aug. 27, 1982, 82 14745
Int. Cl.[4] A61B *3/02*
U.S. Cl. 351—243 **10 Claims**



1. Apparatus for detecting visual deficiencies of the eyes of a patient, comprising:

a cabinet having a cassette receiving surface with (i) a close vision path test image receiving portion, (ii) an intermediate vision path test image receiving portion, and (iii) a far vision path test image receiving portion, said cabinet also having a

vision chamber receiving surface remote from said cassette receiving surface;

a removable cassette disposed adjacent the cassette receiving surface of said cabinet,

said cassette containing a tape or film having thereon a series of close vision test images and a series of intermediate/far vision test images,

said tape or film being wound on two rotatable winding spools spaced apart from each other and positioned so that (i) a portion of the tape film extending between the spools is disposed along said test image receiving portions of said cassette receiving surface of said cabinet, (ii) one of said close vision test images is adapted to be positioned at said close vision path test image receiving portion of said cassette receiving surface, and (iii) one of said intermediate/far vision test images is adapted to be positioned at said intermediate vision path test image receiving portion and at said far vision path test image receiving portion of said cassette image receiving surface of said cabinet;

illumination means for illuminating said test images;

a vision chamber housing attached to said cabinet, said housing defining a vision chamber therein and having a viewing surface adjacent the vision chamber receiving surface of the cabinet,

said vision chamber housing being adapted to receive at least a portion of the head of a patient with the eyes of the patient disposed at predetermined locations within the housing;

an optical system disposed within said cabinet and comprising:

a close vision optical path having a given optical length for optically coupling a close vision test image at said close vision path test image receiving portion of said cassette receiving surface to at least one of said predetermined locations

within said vision chamber housing,

an intermediate vision optical path having an optical length greater than that of said close vision optical path for optically coupling an intermediate/far vision test image at said intermediate vision path test image receiving portion of said cassette receiving surface to at least one of said predetermined locations within said vision chamber housing,

said intermediate vision optical path comprising at least one concave spherical mirror for increasing the optical length of said intermediate vision optical path, and

a far vision optical path having an optical length greater than that of said intermediate vision optical path for optically coupling an intermediate/far vision test image at said far vision path test image receiving portion of said cassette receiving surface to at least one of said predetermined locations within said vision chamber housing,

said far vision optical path comprising at least one concave spherical mirror for increasing the optical length of said far vision optical path; and

spool drive means for rotating at least one of said spools to position a desired one of said test images at a corresponding test image receiving portion of said cassette receiving surface of said cabinet,

whereby the same test image is employed for testing the intermediate vision and the far vision of the patient.

4,597,652

PAPER GUIDE WITH WIDTH SENSING AND WIDTH INDICATION SYSTEM

Dennis W. Dodge, Amherst, N.H., assignor to Itek Corporation, Lexington, Mass.

Filed Jun. 18, 1984, Ser. No. 621,413
Int. Cl.[4] B41B *19/00*; B65H *9/06*
U.S. Cl. 354—7 **30 Claims**

1. A variable width sheet guide system for preventing skewing of sheets comprising:

referencing means for referencing major surfaces of said sheets;

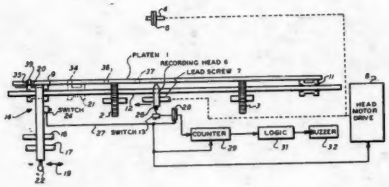
first and second sheet guide means for contacting and guiding said sheets driven therebetween;

sheet guide positioning means for selectively positioning at least one of said sheet guide means at a plurality of discreet predetermined positions across the width of said sheet to enable guiding of sheets of variable widths by said first and second guide means;

image recordation means;

sheet guide actuation means coupled to said first guide means for enabling shifting of said first guide means with respect to said referencing means to accomodate sheets of various widths, said sheet guide actuation means having a first position sensing means for sensing the presence of said image recordation means;

second position sensing means for sensing a home position of said image recordation means;



motor drive means for producing relative motion between said image recordation means and said sheets and for stopping said image recordation means upon the sensing of the presence of said image recordation means by said first position sensing means;

travel measuring means coupled to said first and second position sensing means for measuring the extent of travel of said image recordation means between said first and second position sensing means; and

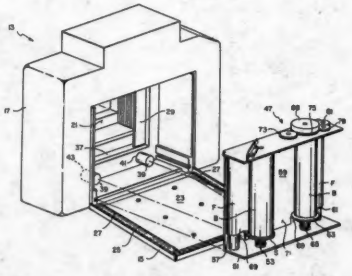
logic means for producing a halt machine operation indication if said extent of travel of said image recordation means, measured by said travel measuring means, does not fall within a plurality of limits indicative of acceptable sheet widths.

4,597,653

ROLL FILM HOLDERS AND MULTI-FORMAT CAMERA

Neil G. Seely, Rochester, and Donald M. Harvey, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 4, 1985, Ser. No. 707,934
Int. Cl.[4] G03B *17/02*
U.S. Cl. 354—21 **5 Claims**



1. An improved roll film holder adapted for use with a

multi-format camera for taking pictures in different sizes on separate rolls of similar length film, wherein the camera has (a) code responsive means for determining a selected picture size and (b) film drive means, wherein said film holder has (a) means for supporting a roll of unexposed film and (b) means for taking-up successive portions of exposed film advanced by the drive means, and wherein the improvement to said film holder comprises:

coded means representative of a selected picture size, said coded means being positioned on said roll film holder for sensing by the code responsive means of the camera to enable the code responsive means to determine the selected picture size; and

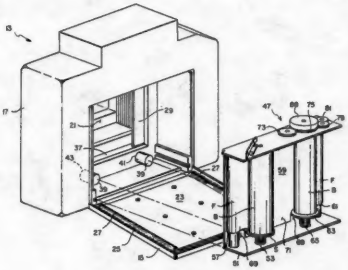
metering means corresponding to the selected picture size, said metering means being positioned on said film holder for engagement with the drive means of the camera for metering roll film in predetermined length increments related to the selected picture size.

4,597,654

CODED ROLL FILM HOLDER AND CODE RESPONSIVE CAMERA

Donald M. Harvey, Webster, and Neil G. Seely, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 4, 1985, Ser. No. 707,933
Int. Cl.[4] G03B *7/24, 17/02, 19/04*
U.S. Cl. 354—21 **6 Claims**



1. A multi-format camera for taking pictures in a number of sizes, and adapted to receive a plurality of roll film holders individually coded to indicate the respective picture sizes, said camera comprising:

a taking lens for forming a focal plane;

means for positioning a film holder received in said camera to support successive portions of the roll film in the focal plane;

means for defining a variable size exposure area to record different size pictures on respective film portions in the focal plane and for maintaining the exposure area centered with respect to the same point as the size of the exposure area is changed; and

code responsive means for determining the effective size of the exposure area in accordance with the picture size coded on a film holder received in said camera.

4,597,655

CAMERA WITH MOVABLE FILM PACK AND ROTATABLE LENS FOR SEQUENTIAL EXPOSURES AND PHOTO IDENTIFICATION SYSTEM

Arthur S. Mann, Jupiter, Fla., assignor to Identrol, Miami, Fla.

Filed May 3, 1985, Ser. No. 730,062
Int. Cl.[4] G03B *1/00, 17/18, 17/24*
U.S. Cl. 354—121 **17 Claims**

1. A camera for producing multiple, sequential generally equisized images on a film element comprising:

a front support plate having multiple apertures therein;

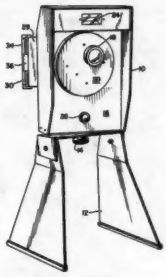
a lens turret assembly rotatably mounted on a front wall of said front support plate and having a single lens sequentially rotatable into selective registry with said front support plate apertures;

a back support plate;

a film support plate;

means for mounting and bidirectionally moving said film support plate transversely across the rear of said back support plate;

a plurality of apertures formed through said back support plate, said front and back plate apertures being aligned whereby images may be transferred from said lens through selected aligned pairs of said front and back plate apertures to said film support plate;



means defining a plurality of apertures through said film plate, said film plate apertures having dimensions approximately the same as said back plate apertures;

means for mounting a film pack cartridge on the rear of said film plate, over said film plate apertures; and

shutter actuated means mounted adjacent said front plate apertures;

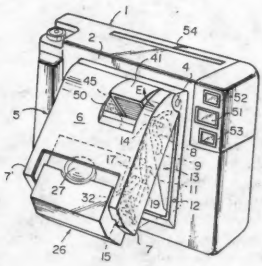
whereby upon predetermined, sequential rotation of said lens turret or transverse movement of said film plate, selected ones of said film plate apertures are brought into unobstructed registry with said lens for exposure of an image through a selected back plate aperture from said single lens.

4,597,656

FOLDING TYPE CAMERA

Yoshimi Yamashita, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Tokyo, Japan

Filed Sep. 26, 1984, Ser. No. 655,028
Claims priority, application Japan, Sep. 30, 1983, 58-182806
Int. Cl.[4] G03B *17/04*
U.S. Cl. 354—193 **7 Claims**



1. A folding type camera comprising:

(i) a front cover which is fabricated of a front plate standing

face to face with an opening in a front face of a camera body and a pair of side plates joined respectively with side end potions of said front plate, and which is supported on the camera body for swinging around a swing shaft positioned in parallel with a film supporting face of the camera body in the vicinity of end portions of said side plates,

(ii) rotatable levers each having one end portion supported on the camera body for rotation around a rotation shaft parallel with said swing shaft, and an engagement boss positioned near the other end portion for engagement with a guide groove in each of said side plates so that, as said front cover is swung, said rotatable levers are rotated and said engagement bosses enter introducing portions at end portions of said guide grooves, thereby maintaining said front cover in a predetermined swung position where said opening is opened,

(iii) slide members supported for sliding along said side plates in the direction approximately normal to said swing shaft and engaged with the vicinity of the other end portions of said rotatable levers so that, when said front cover is swung to said predetermined swung position, said slide members are pushed by said rotatable levers moving in engagement with said front cover and are slid away from said swing shaft,

(iv) slide member locking mechanisms for locking said slide members at predetermined slid positions when said front cover is swung up to said predetermined swung position, and

(v) a shutter board for supporting a photograph taking lens, said shutter board being supported at front end portions of said slide members for rotation around a rotation shaft parallel with said swing shaft so that, when said front cover is opened up to said predetermined swung position, said shutter board is rotated to a rotated position where said photograph taking lens becomes parallel to the film supporting face of the camera body.

4,597,657

COMPACT CAMERA CAPABLE OF ENCASING A PHOTOTAKING OPTICAL SYSTEM

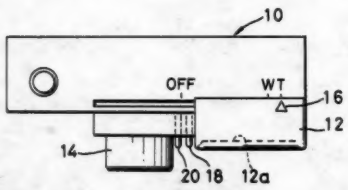
Hiroshi Wakabayashi, Yokohama, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Oct. 9, 1984, Ser. No. 658,509

Claims priority, application Japan, Oct. 17, 1983, 58-193996; Oct. 26, 1983, 58-200614

Int. Cl.⁴ G03B *3/10*; G03S *17/04*

U.S. Cl. 354—195.12 **14 Claims**



1. A camera comprising:

(a) picture-taking means, including a phototaking optical system, functioning to enable said camera to take a picture of an object;

(b) means acting on said optical system to change an optical property of said optical system between a first property and a second property different from said first property;

(c) means for disabling said picture-taking means to prevent said camera from taking a picture;

(d) operating means including an operation member manually settable to a plural number of operation positions, selectively, including first, second and third operation positions; and

(e) means for controlling said acting means and said disabling means in response to said operating means, said control means controlling said acting means in such manner that the optical property of said optical system is changed to said first property by a manual setting of said operation member into said first operation position and said optical property is changed to said second property by a manual setting of said operation member into said second operation position, and controlling said disabling means in such a manner that said disabling means is actuated by a manual setting of said operation member into said third operation position.

4,597,658

LIGHT-TIGHT CASSETTE

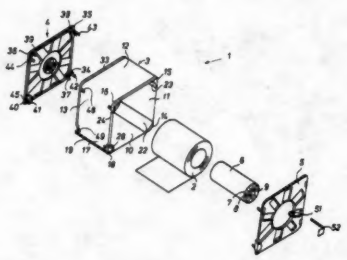
Edward Buelens, Kontich, and Carolus C. Goossens, Berchem, both of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed Dec. 5, 1984, Ser. No. 678,469

Claims priority, application European Pat. Off., Dec. 12, 1983, 83201748.7

Int. Cl.⁴ G03B *17/26*

U.S. Cl. 354—275 **6 Claims**



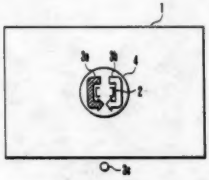
1. A light-tight cassette suitable for holding a roll of web-like light-sensitive photographic material wound around a core and for dispensing the same through a slit provided in said cassette wherein said cassette is in the form of a box comprising a generally rectangular hollow shell having said material-dispensing slit extending in an axial direction in one corner thereof and having a generally smooth continuous surface around the exterior thereof from one slit edge to the other slit edge; closure walls for the shell ends, said end closure walls being generally rectangular corresponding to said shell and carrying inwardly directed central axially projecting hubs for rotatably supporting the ends of said core; latchable detent means for at least one of said end closure walls, said detent means comprising an aperture radially penetrating the shell at the three other corners thereof adjacent the associated end closure wall, said end closure wall carrying at its three corners corresponding to the perforated corners of said shell axially directed detent fingers each having a lateral projection thereon for engagement with said shell perforation to retain said end closure wall on the end of said shell; and situated radially inwardly of each perforated shell corner, an inner wall joined along its side edges to the interior wall of said shell and constituting a light shield preventing light passing through said shell perforations from intruding into the shell interior internally of said inner walls.

4,597,659

IN-FOCUS STATE DISPLAY DEVICE FOR CAMERA

Yasuo Suda; Kiyoshi Aiyfuku; Akio Sunouchi, and Nobuyuki Suzuki, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 23, 1984, Ser. No. 613,592
Claims priority, application Japan, May 26, 1983, 58-92896
Int. Cl.[4] G03B *3/00*
U.S. Cl. 354—409 9 Claims



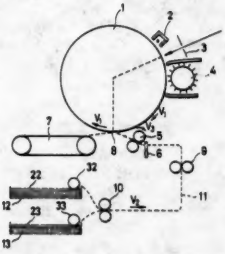
1. An in-focus display device for a camera, comprising:
first detecting means for detecting a signal representing an in-focus state;
first display means for displaying an in-focus state outside the visual field of a view finder in response to a signal from said first detecting means;
second display means for displaying a mark indicative of an in-focus state within the view finder visual field in response to the signal from said first detecting means; and
a control circuit for causing said first display means to effect an in-focus state display after the in-focus state display by said second display means is extinguished.

4,597,660

HIGH SPEED COPYING MACHINE

Svay Leng; Saburo Suganuma, and Hiroyuki Katsoka, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Mar. 9, 1982, Ser. No. 356,543
Claims priority, application Japan, Mar. 12, 1981, 56-34633
Int. Cl.[4] G03G *21/00, 15/16*
U.S. Cl. 355—3 SH 7 Claims



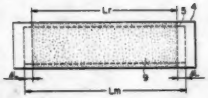
1. A high speed copying machine, comprising:
a photo-sensitive drum having a transfer point thereon;
a sheet containing tray;
releasable stop means provided between said tray and said transfer point;
first feed means for conveying sheets from said stop means along a predetermined sheet conveying path to said transfer point on said photo-sensitive drum at a speed equal to the peripheral speed of said drum; and
second feed means for conveying sheets from said tray to said stop means at a speed greater than the peripheral speed of said drum to ensure positioning of a sheet against said stop means prior to release of said stop means when movement of a sheet from said tray and movement of said transfer points are initiated simultaneously.

4,597,661

MAGNET ROLL ASSEMBLY

Keitaro Yamashita, Kansato, Japan, assignor to Hitachi Metals Ltd., Tokyo, Japan

Filed Apr. 17, 1984, Ser. No. 601,166
Claims priority, application Japan, Apr. 18, 1983, 58-67036
Int. Cl.[4] G03G *15/09*
U.S. Cl. 355—3 DD 9 Claims



1. The magnet roll assembly for use in an apparatus for developing an electrostatic latent image with a magnetic brush, comprising:
a permanent magnet member having a first end and a second end;
a non-magnetic sleeve surrounding said permanent magnet member from said first end to said second end; and
a roughened surface region on said sleeve terminating inwardly with respect to each end of said permanent magnet member, said non-magnetic sleeve adapted to carry a magnetic developer layer of substantially uniform height along the length thereof upon the application of toner to said roughened surface region and the portions of said sleeve outwardly thereof.

4,597,662

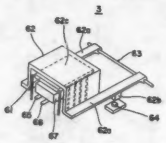
COPIER START BUTTON WITH DIAGNOSTIC INFORMATION

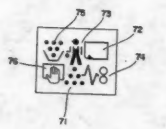
Sumiaki Hirata, Aichi; Masazumi Ito, Toyohashi, and Kenji Shibazaki, Aichi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 31, 1984, Ser. No. 575,805
Claims priority, application Japan, Jan. 31, 1983, 58-14991
Int. Cl.[4] G03G *21/00*
U.S. Cl. 355—14 R 11 Claims

1. In an operation device for use in a copying machine including a start means for starting a copying operation of the copying machine and fault detecting means for detecting a fault occurring in the copying machine operation such as the fault of the transferring of the copying paper of the fault of the control operation, the improvement characterized in that the start means comprises a manually operable key member having a cover plate made of a transparent material, a switch means being operable by a pushing operation of the key member for production of a signal to start the copying operation, display means of a light transmitting type disposed below the cover plate for displaying selectively one of a plurality of symbols each representing information concerning the operational status of the copying machine including at least a fault indica-

tion of the copying machine in response to a signal from the fault detecting means, and light emitting means disposed below





the display means for illuminating the symbol on the display means through the cover plate.

4,597,663

ELECTROPHOTOGRAPHIC COPYING MACHINE OF AUTOMATIC MAGNIFICATION/REDUCTION-CONTROLLABLE TYPE

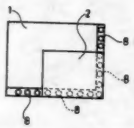
Shoichiro Yoshiura, and Haruyoshi Ikeda, both of Yamatokoriyama, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

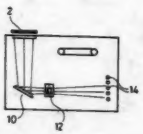
Filed Apr. 4, 1985, Ser. No. 719,869

Claims priority, application Japan, Apr. 5, 1984, 59-69774

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—14 R **4 Claims**





1. An electrophotographic copying machine of an automatic magnification/reduction-controllable type comprising:

measurement means for measuring the lengths of a horizontal side and a vertical side of a copy document;

comparison means responsive to said measurement means for comparing the length of the horizontal side with that of the vertical side; and

display means responsive to said comparison means for displaying either a first type of copy paper suitable for longitudinal feed when the length of the horizontal side is longer than that of the vertical side or a second type of copy paper when the length of the horizontal side is shorter than that of the vertical side.

4,597,664

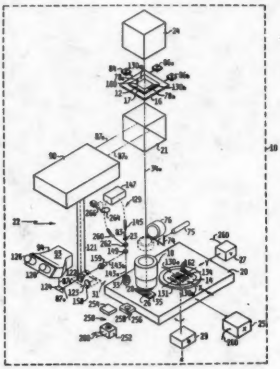
STEP-AND-REPEAT PROJECTION ALIGNMENT AND EXPOSURE SYSTEM WITH AUXILIARY OPTICAL UNIT

Karl-Heinz Johannsmeier, Los Altos, and Edward H. Phillips, Middletown, both of Calif., assignors to Optimetrix Corporation, Mountain View, Calif.

Division of Ser. No. 289,790, Aug. 3, 1981, Pat. No. 4,452,526, which is a continuation of Ser. No. 126,007, Feb. 29, 1980, abandoned. This application May 31, 1984, Ser. No. 615,595

Int. Cl.[4] G03B *27/52*

U.S. Cl. 355—43 **2 Claims**



1. Alignment apparatus for interchangeably aligning an object with respect to images of first and second elements, said apparatus comprising:

a first holder for holding the first element;

a first optical unit for producing an image of the first element at an image plane;

a second holder, spaced from the first holder, for holding the second element;

a second optical unit, spaced from the first optical unit, for producing and image of the second elememt at the image plane;

a third holder for holding the object;

a stage, movable along coordinate axes, for permitting relative movement between the object and both images of the first and second elements so that the object may be aligned with respect to the image of the first element and also with respect to the image of the second element; and

light source means for selectively illuminating the entire field of view of the second optical unit with light not passing through the second element.

4,597,665

DUAL COLLECTOR OPTICAL FLAW DETECTOR

Lee K. Galbraith, Mountain View, and Karel Urbanek, Atherton, both of Calif., assignors to Tencor Instruments, Mountain View, Calif.

Continuation-in-part of Ser. No. 559,909, Dec. 9, 1983. This application May 14, 1984, Ser. No. 610,101

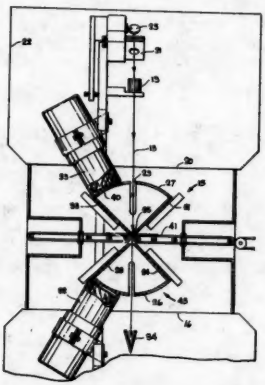
Int. Cl.[4] G01N *21/00*

U.S. Cl. 356—237 **16 Claims**

1. Flaw detector apparatus for detecting particles and holes in thin test members having an optical density such that an inspection beam passes therethrough, but is partially reflected from the surface of the member, comprising,

means for optically scanning a test surface with a beam directed along an optical axis, the beam, upon impingement with the test surface, having an axial component along said optical axis, a specularly reflected component and a scattered component above the surface and a diffracted component through any small holes in the surface,

first light collector means disposed above said surface for admitting the beam into the first light collector means and collecting the scattered light component derived from particles on the surface while simultaneously dumping the beam component specularly reflected from the test surface, and



second light collector means disposed below the surface for admitting the beam into the second collector means transmitted through the surface and collecting light diffracted through holes in the surface while simultaneously dumping the beam component directed along the optical axis.

4,597,666

APPARATUS FOR DETERMINING THE LIQUID WATER CONTENT OF A GAS

Hermann E. Gerber, Reston, and Bernard G. Ulfers, Blacksburg, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 18, 1984, Ser. No. 601,516
Int. Cl.[4] G01N *21/49*
U.S. Cl. 356—338 **4 Claims**

1. An apparatus for determining the liquid water content of a sample gas having liquid water droplets suspended therein comprising:

a light source means passing a collimated light beam along an optical axis through the sample gas, some of the light in the light beam being forward scattered by the suspended water droplets, wherein in a plane intersecting the light bean an area of the plane is intersected by the light beam;

a region lying in said plane which intersects the light beam such that said area in the plane is intersected by the light beam, said region being continuous and closed, and wherein said region totally surrounds the area, the scattered light directed toward said region being denoted as regional scattered light;

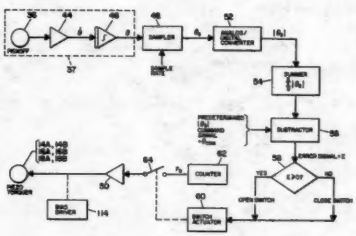
sensor means positioned along the optical axis for detecting the total flux of substantially all of the regional scattered light, including a photodetector having a planar light sensitive surface which is coplanar with, and which occupies the same area as said region, said sensor means also incldiuing a light trap means comprising a tube whose axis is aligned with the optical axis, said tube having two ends, wherein one of said ends is closed such that nonscattered light in the light beam incident on the closed end is blocked from said photodetector and the end of said tube closest to said light source means has an outer edge, said light sensitive surface having an outer periphery such that a line intersecting the outer edge of said tube and intersecting the point of said light sensitive surface outer periphery farthest from the optical axis forms an angle θ_2 with respect to the optical axis, and wherein a line intersecting the point from which the light beam originates from said light source means and also intersecting said outer edge of said tube forms an angle θ_1 with respect to the optical axis, wherein $\theta_2-\theta_1$ is not more than about 10 degrees and θ_1 is not more than about 0.5 degrees, positioned along the optcal axis between said light source means and said photodetector so as to receive nonscattered light in the light beam, said light trap means blocking the nonscattered light from being incident on said light sensitive surface of said photodetector, wherein the nonscattered light in the light beam between said light source means and said sensor means illuminates along its entire length a volume in space, the volume in space being totally occupied by the sample gas, whereby said detected total flux is proportional to the liquid water content of the sample gas.

4,597,667

DITHER CONTROLLER FOR RING LASER ANGULAR ROTATION SENSOR

Robert D. Curby, Thousand Oaks, and George H. McCammon, Simi Valley, both of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Dec. 9, 1982, Ser. No. 448,363
Int. Cl.[4] G01C *19/64*
U.S. Cl. 356—350 **103 Claims**



1. In combination:

A ring laser rotation sensor body;

A support for said body;

Spring means between said body and said support for connecting said body on said support for resilient oscillation about a predetermined axis;

Means for sensing and producing a signal which is a measure of physical variable, chosen from the class consisting of angular acceleration, angular velocity and angular displacement, between said body and said support about said axis;

Torquer means for applying an oscillating bias torque to said body relative to said support; and

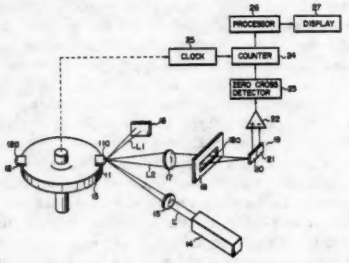
Means for energizing and deenergizing said torquer means in response to the amplitude of said physical variable signal.

4,597,668

DEVICE FOR CHECKING POSITIONAL ACCURACY

Akira Ono, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 26, 1983, Ser. No. 488,706
Int. Cl.[4] G01B 11/26
U.S. Cl. 356—372 14 Claims



1. A device for checking positional accuracy of inspection parts on a moving object, said object having a plurality of said inspection parts mounted in a predetermined positional relation to one another, said device comprising:

means for radiating a light beam in a fixed direction toward said object, said light beam being adapted to selectively reflect from said inspection parts in a predetermined direction;

means for converting said light reflected by said inspection parts into electric signals indicative thereof;

means for measuring signal intervals of said electric signals and obtaining values indicative thereof; and

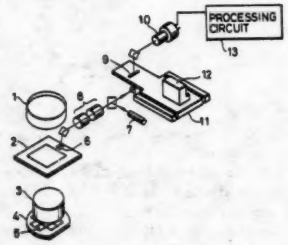
means for calculating the precision of said positional relation among said inspection parts from said values obtained from said measuring means.

4,597,669

PATTERN DETECTOR

Tsuneo Terasawa, Hachioji; Shinji Kuniyoshi, Suginami; Akihiro Takanashi, Kokubunji; Toshiei Kurosaki, Edogawa; Yoshio Kawamura, Koutou, and Sumio Hosaka, Nishitama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 7, 1983, Ser. No. 539,760
Claims priority, application Japan, Oct. 18, 1982, 57-181337
Int. Cl.[4] G01N 21/86; G01B 11/00
U.S. Cl. 356—401 3 Claims



1. A pattern detector comprising:

a detection signal deriving portion in which a specimen is illuminated, whereupon an intensity distribution of light reflected from or transmitted through the specimen is photoelectrically converted and then derived as a detection signal; and

a processing portion which executes signal processing for measuring a specimen position from the derived detection signal;

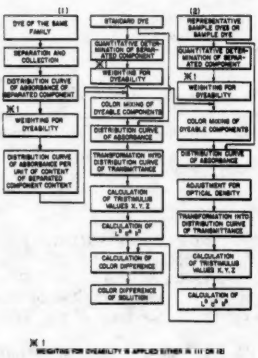
wherein said processing portion comprises (a) means for calculating a centroid of the detection signal, including means for calculating a primary moment of the detection signal, means for calculating an integral value of the detection signal, and means for dividing the primary moment by the integral value; and (b) a symmetry calculating portion which detects the specimen position near the centroid of the detection signal calculated by said centroid calculating means.

4,597,670

METHOD OF MEASURING COLOR DIFFERENCE OF DYESTUFFS

Hiromu Ohashi, Sakai; Masakazu Suzuka, Ibaraki; Yukio Murata, Takatsuki, and Nobuyoshi Fujitsuka, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Feb. 27, 1984, Ser. No. 583,851
Claims priority, application Japan, Dec. 1, 1983, 58-227189
Int. Cl.[4] G01N 21/25
U.S. Cl. 356—405 3 Claims


(1)
(2)
DYE OF THE SAME FAMILY
STANDARD DYE
REPRESENTATIVE SAMPLE DYES OR SAMPLE DYE
SEPARATION AND COLLECTION
QUANTITATIVE DETERMINATION OF SEPARATED COMPONENT
DISTRIBUTION CURVE OF ABSORBANCE OF SEPARATED COMPONENT
WEIGHTING FOR DYEABILITY
COLOR MIXING OF DYEABLE COMPONENTS
DISTRIBUTION CURVE OF ABSORBANCE
DISTRIBUTION CURVE OF ABSORBANCE PER UNIT OF CONTENT OF SEPARATED COMPONENT CONTENT
TRANSFORMATION INTO DISTRIBUTION CURVE OF TRANSMITTANCE
CALCULATION OF TRISTIMULUS VALUES X, Y, Z
ADJUSTMENT FOR OPTICAL DENSITY
CALCULATION OF L* a* b*
CALCULATION OF COLOR DIFFERENCE
COLOR DIFFERENCE OF SOLUTION

1. A method for measuring the color different between a sample dye and a standard dye by testing the color properties of both dyes, which comprises:

(a) measuring the distribution curve of absorbance of each component of the dye by separating each of the components contained in the standard dye and in representative samples of the dye by chromatography, determining the content of each separated component by quantitative analysis, measuring a distribution curve of absorbance for each component separated, and calculating a distribution curve of absorbance per unit content for each component separated;

(b) deriving a relationship between color differences of dye solutions and color differences of dyeings made with the standard dye and the representative samples by using the previously determined distribution curves of absorbance per unit content of the separated components and the contents determined by quantitative analysis of each separated component with respect to the standard dye and the representative samples, thereby to obtain the distribution curves of absorbance of a mixture with respect to the standard dye and the representative samples, setting the said distribution curves of absorbance of the representative samples obtained to coincide with that of the standard dye using optical density ratios between the standard dye and the representative samples, transforming the said distribution curve of absorbance of the standard dye obtained and the said coincident distribution curves of absor-

bance of the representative samples into transmittance curves to obtain tristimulus values X, Y, Z for both the standard dye and the representative samples, transforming the tristimulus values into a uniform color scale colorimetric system and determining hue and saturation or brightness difference between the standard dye and representative samples in that colorimetric system, determining the color differences between dyeings prepared with the standard dye and the representative samples in terms of hue and saturation or brightness, and deriving the relationship between the previously determined color differences of the dye solution and the previously determined color differences of the dyeings in terms of hue and saturation or brightness;

(c) calculating the color differences between standard dye and solutions of the sample dye in terms of hue and saturation or brightness, as previously described; and

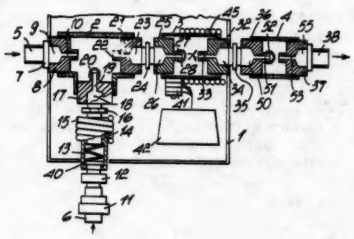
(d) predicting the color differences of dyeings of the sample dye from the color differences of the solution of the sample dye previously determined using the relationship derived above.

4,597,671

APPARATUS FOR EMULSIFYING AND ATOMIZING FLUID FUELS WITH SECONDARY FLUIDS, IN PARTICULAR WATER

Ernesto Marelli, Via Segré , 3-Monza (Province of Milano), Italy

Filed Apr. 30, 1984, Ser. No. 605,454
Claims priority, application Italy, May 3, 1983, 20916 A/83
Int. Cl.[4] B01F *15/02*
U.S. Cl. 366—127 **4 Claims**



1. An apparatus for emulsifying and atomizing fluid fuels with secondary fluids, in particular water, comprising separate inlets for the fluid fuel and secondary fluids to be emulsified together, and mechanical cavitation chambers, at least one combined mechanical and electromagnetic action cavitation chamber adapted to generate within the chamber itself a centered corridor wherethrough said fuels, fluid and secondary fluid, as already mixed together, are caused to flow, wherein the inlet for the secondary fluid comprises a resonant body of a magnetizable material, said body being immersed in a magnetic field generated by external windings to said body and adapted to generate a centered corridor.

4,597,672

CENTER DISCHARGE MIXER FOR FLUENT AND NONFLUENT MATERIAL

Benjamin R. Neier, Dodge City, Kans., and Donald L. Stirling, Ridgetown, Canada, assignors to Stirco, Inc., Ontario, Canada

Continuation-in-part of Ser. No. 595,264, Mar. 30, 1984, Pat. No. 4,506,990. This application Jan. 17, 1985, Ser. No. 692,217
Int. Cl.[4] B01F *7/08, 15/02*
U.S. Cl. 366—186 **12 Claims**

1. A material mixer, comprising

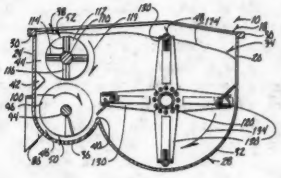
a mixer tank including forward and rearward end walls, a bottom wall and opposite side walls,

said bottom wall including a first relatively large curved wall portion defining the bottom of a main chamber, a second relatively smaller curved wall portion defining the bottom of an auxiliary chamber, and an enlongated ridge at the junction of said curved wall portions,

said second curved wall portion including a discharge opening at a position substantially spaced from both end walls, a movable door and means for selectively moving said door to close and open said discharge opening,

a rotor rotatably supported within said main chamber for mixing materail therein and moving material across said first wall portion toward said auxiliary chamber,

a lower auger having opposite end portions and reverse flighting sections on said opposite end portions for moving material in opposite axial directions in response to rotation of said lower auger,



means for supporting said lower auger in said auxiliary chamber adjacent said second wall portion for rotation in a direction to move material axially toward said discharge opening,

an upper auger,

means for supporting said upper auger in said auxiliary chamber above said lower auger for rotation in a direction to move material axially of said upper auger, and

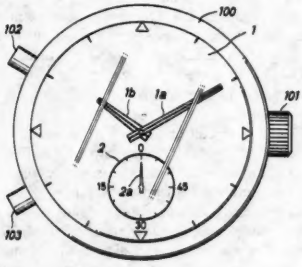
drive means for rotating said rotor and upper and lower augers.

4,597,673

ANALOGUE TYPE TIMER

Hiroyuki Kihara, Tanashi, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Apr. 15, 1985, Ser. No. 723,626
Claims priority, application Japan, Apr. 20, 1984, 59-79773
Int. Cl.[4] G04B *19/00;* **G04F** *10/00*
U.S. Cl. 368—80 **7 Claims**



1. An analogue type timer comprising:

a reference signal generator;

a frequency division circuit for dividing the reference signal from the reference signal generator;

means for generating normally-rated timer unit signal on the basis of the output of said frequency division circuit;

a pulse motor to be driven by the normally-rated timer unit signal;

a hand operatively connected to the pulse motor for moving around the face of the timer;

a timer counter for counting the normally-rated timer unit signals supplied to the pulse motor; and

means for setting the timer for a desired length of time characterized in that it further comprises:

means for generating a high-rated timer unit signal which is shorter in period than the normally-rated timer unit signal;

means for detecting the point of time when the content of the timer counter corresponds to a predetermined remaining length of time; and

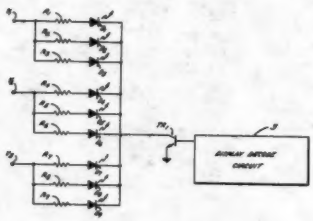
means responsive to the output signal from said detecting means for supplying, in place of the normally-rated timer unit signal, the high-rated timer unit signal to the pulse motor, whereby the hand of the timer is allowed to advance step by step under the control of the normally-rated timer unit signal over the major part of the length of set time on the indicating dial of the timer whereas the hand of the timer is allowed to advance one round of the indicating dial of the timer for every step of advance over the remaining predetermined length of set time under the control of the high-rated timer unit signal, instead of step by step advance under the control of the normally-rated timer unit sinal.

4,597,674

MULTIPLEX DIGITAL CLOCK

William H. Thompson, III, 143 N. 58th St., Philadelphia, Pa. 19139

Filed Mar. 30, 1984, Ser. No. 595,561
Int. Cl.[4] G04C *19/00*
U.S. Cl. 368—83 **5 Claims**



1. An electronic timepiece apparatus for sequentially displaying seconds, minutes and hours, each in a different color code, on single display, comprising:

a two-digit, numeric L.E.D. display, the elements of said display each being composed of a triad of three L.E.D.'s, of which each L.E.D. is of one of three colors, said L.E.D. display thereby being capable of displaying two digit numbers in one of three colors;

a power supply;

a display driver circuit connected to said L.E.D. display to selectively power L.E.D. elements of said first color, said second color and said third color, said driver circuit also being connected to said power supply;

a time keeping circuit connected to said power supply for simultaneously supplying a train of first, faster clock pulses and a train of second, slower clock pulses;

a multiplexer circuit connected to said time keeping circuit to receive both said first clock pulses and said second clock pulses, said multiplexer circuit providing output signals to said display driver circuit;

a display select circuit connected to receive said multiplexer circuit output signals and connected to receive said first clock pulses and said second clock pulses from said time keeping circuit; and

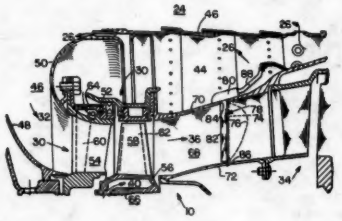
a display decode-drive circuit connected to said display select circuit output, said display decode-drive circuit having its output connected to said L.E.D. display.

4,597,675

MEAN TEMPERATURE SENSOR

Hans F. W. Maertins, Phoenix; James C. Mays, Mesa, and Charles E. Corrigan, Tempe, all of Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Apr. 4, 1983, Ser. No. 481,539
Int. Cl.[4] G01N *25/14*; G01K *3/02*
U.S. Cl. 374—115 **42 Claims**



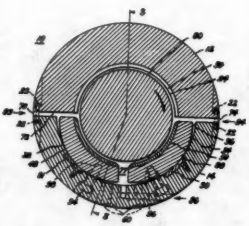
1. Apparatus comprising a flow path for communicating a flow of fluid therein, fluid flowing in said flow path having a nonconstant temperature which is considered transversely to said flow path so as to define a temperature profile, an elongate thermosiphon immersed substantially entirely in said fluid flow and extending transversely thereof, said thermosiphon defining at least one vaporizer section and at least one condenser section dependent upon said temperature profile, and means in communication with said thermosiphon for sensing the temperature or absolute pressure of vapor therein and transducing said sensed temperature or pressure to a signal analogous to the means of said temperature profile.

4,597,676

HYBRID BEARING

John H. Vohr, Schenectady; William H. Miller, Albany, and Jeffrey J. Perkins, Fultonville, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 30, 1984, Ser. No. 605,447
Int. Cl.[4] F16C *17/03*
U.S. Cl. 384—114 **15 Claims**



1. A hybrid bearing for supporting a horizontally oriented, rotatable shaft on a film of oil, comprising:

a housing for encasing an axial portion of said shaft, said housing having an upper and a lower portion;

a fixed arc journal bearing disposed in the upper portion of said housing, said fixed arc bearing having a surface operationally disposed in close proximity to yet spaced from said shaft to allow oil to flow through the interstice between said fixed arc bearing surface and said shaft;

at least a pair of arcuate tilting pads each pivotably disposed in the lower portion of said housing, each said pad operationally circumferentially disposed about a portion of said shaft, and each said pad having a pad bearing surface operationally including the film of oil and operationally disposed in close

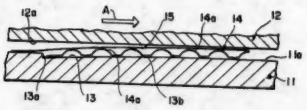
proximity to yet spaced from said shaft to support the rotating shaft on the film of oil; and

means for channeling said oil to said fixed arc bearing surface and said tilting pad bearing surfaces, said means for channeling disposed between the leading edge of the fixed arc journal bearing surface and the proximate pad.

4,597,677
LEAF-TYPE FOIL THRUST BEARING

Yoshiyuki Hagiwara, and Teru Morishita, both of Aichi, Japan, assignors to Taiho Kogyo Co. and Toyota Motor Corp., both of, Japan

Filed Oct. 11, 1985, Ser. No. 786,936
Claims priority, application Japan, Oct. 13, 1984, 59-213262
Int. Cl.[4] F16C *32/06*
U.S. Cl. 384—105 **4 Claims**

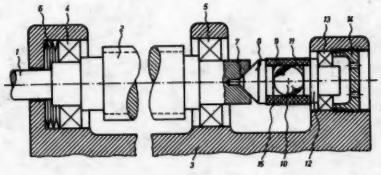


1. A leaf-type foil thrust bearing comprising: a rotating bearing member, a fixed seat member, said seat member having a thrust surface opposing a bearing surface of said bearing member, said thrust surface having formed therein a plurality of recesses, each of said recesses becoming gradually shallower in a direction from a forward edge to a rear edge of said recesses in a direction of rotation of said rotating member; a plurality of corrugated foils, each of said corrugated foils being disposed in a respective one of said recesses, each of said corrugated foils having a constant corrugation height, and each of said corrugated foils extending from a forward edge of each of said recesses to the rearward edge of said recesses; and a plurality of substantially planar sheet-like top foils, one of said top foils being arranged over each of said corrugated foils, and each of said top foils having an end adjacent the respective forward edge of the respective recess fixed to said thrust surface.

4,597,678
BEARING DEVICE FOR THREADED SPINDLES

Rolf Angelbeck, Kiel; Reinhard Gesell, Schoenkirchen, and Matthias Goessner, Malente, all of Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Oct. 31, 1985, Ser. No. 793,553
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1984, 3447162
Int. Cl.[4] F16C *19/12*
U.S. Cl. 384—452 **5 Claims**



1. A bearing device for supporting a threaded spindle, wherein the improvement comprises there being provided:

a spindle supporting body which includes means defining spindle supporting bearing receiving bores and means defining a centering bearing receiving bore, said bore means being axially aligned;

a plurality of bearings, each mounted in a bore and each axially movable within said bore;

spindle means supported for rotation in spindle supporting bearings, one end face of said spindle means having a central inside cone' therein;

biasing means associated with said body for urging said spindle axially in the direction of the spindle end face having the central inside cone;

centering means which includes a bearing point member having a bearing point for engagement with said spindle inside cone and a planar surface axially opposite said bearing point;

a ball assembly having a ball and a resilient outer bushing, said assembly engaging the planar surface of said bearing point member and the centering bearing, said ball assembly constructed to permit rolling movement of said ball in a direction transvere to said spindle;

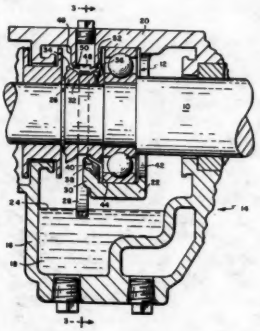
adjustment means for urging said centering bearing toward said ball assembly, said ball assembly toward said bearing point, said bearing point into said cone and said spindle against said biasing means;

so as to permit accurate axial adjustment of said support device and transverse rolling of said ball in said ball assembly.

4,597,679
APPARATUS FOR LUBRICATING A BEARING ASSEMBLY

Henry W. Wlodkowski, Holden, Mass., assignor to Coppus Engineering Corporation, Worcester, Mass.

Filed Oct. 3, 1985, Ser. No. 783,423
Int. Cl.[4] F16C *33/66, 33/10;* F01M *9/06*
U.S. Cl. 384—462 **4 Claims**



1. For use in combination with a horizontal shaft journaled for rotation in a bearing, apparatus for lubricating said bearing, said apparatus comprising:

housing means forming a sump underlying said shaft, said sump being adapted to contain a supply of liquid lubricant;

a sleeve mounted on said shaft for rotation therewith at a location axially adjacent to said bearing, said sleeve having a cylindrical surface and an inclined surface extending axially and radially outwardly from said cylindrical surface towards said bearing;

a ring suspended from said sleeve, said ring having an inner diameter which is larger than the outer diameter of said sleeve, with the lowermost portion of said ring being spaced vertically beneath the underside of said sleeve and being arranged to depend downwardly into the lubricant in said sump, said ring being rotatable in response to rotation of said shaft and sleeve to thereby carry lubricant on the surface thereof upwardly from said sump, with the thus carried lubricant ultimately being returned to said

sump by a combination of cetrifugal and gravitational forces; and

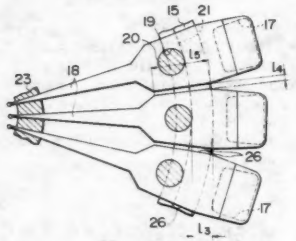
dam means extending from said bearing into the space between the lowermost portion of said ring and the underside of said sleeve, said dam means including a second inclined surface cooperating in radially spaced relationship with the inclined surface on said sleeve to define a passageway leading towards said bearing, said dam means being configured and dimensioned to divert a significant portion of the returning lubricant through said passageway to said bearing.

4,597,680

DOT PRINTER HEAD WITH ALTERNATE MAGNETIC FLUX PATHS

Takashi Norigoe, and Kuniaki Ochiai, both of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Sep. 25, 1984, Ser. No. 654,022
Claims priority, application Japan, Sep. 26, 1983, 58-177266
Int. Cl.[4] B41J *3/12*
U.S. Cl. 400—124 **2 Claims**



1. A dot printer head comprising:

(a) a guide frame;

(b) an annular yoke mounted on said guide frame;

(c) a plurality of cores arranged radially on said annular yoke;

(d) a plurality of coils, one of said plurality of coils being mounted on each one of said plurality of cores and being installed in such a way that the coils on each side of any given coil have magnetic fluxes the directions of which are opposite to the direction of the magnetic flux in said any given coil;

(e) a plurality of armatures pivotably mounted on said annular yoke, one of said plurality of armatures being operatively associated with each one of said plurality of cores, each one of said plurality of armatures being pivotable about a corresponding fulcrum point on said annular yoke, each one of said plurality of armatures having two radially extending side surfaces extending radially inwardly and radially outwardly of said fulcrum points, the radially extending side surfaces on adjacent ones of said plurality of armatures being separated by a small clearance through which magnetic flux flows during use of the dot printer head, a guide hole being formed in each one of said plurality of armatures, said guide holes being located radially inwardly of said fulcrum points but contacting said fulcrum points;

(f) a plurality of print needles, one of said plurality of print needles being operatively connected to each one of said plurality of armatures; and

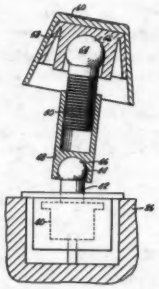
(g) a plurality of armature guides mounted on said guide frame, each one of said plurality of armature guides being received in a corresponding one of said guide holes in said plurality of armatures.

4,597,681

ADJUSTABLE KEYBOARD

Anthony N. Hodges, 3238 Paty Dr., Honolulu, Hi. 96822

Filed Dec. 15, 1983, Ser. No. 561,902
Int. Cl.[4] B41J *5/10, 5/12*
U.S. Cl. 400—488 **18 Claims**



1. An adjustable keyboard for a typewriter, computer, or similar machine comprising

a support having a width extending in a lateral direction and a depth extending in a transverse direction,

first and second base plates positioned in side by side relation and having adjacent lateral edges hinged together for relative pivotal motion about a transverse axis,

means for mounting said baseplates to said support for folding and unfolding motion between a first position wherein each said baseplate extends upwardly from said support toward its hinged edge to form an inverted V defining a relatively small included angle between the baseplates and wherein outer lateral edges of the baseplates are spaced relatively closer to one another, and a second position wherein each said baseplate has its hinged edge closer to said support and said outer lateral edges are spaced relatively further from one another to define a relatively larger included angle;

means for maintaining said baseplates in any one of a plurality of adjusted positions between said first and second positions;

first and second sets of keys on respective ones of said baseplates, said sets collectively forming a substantial full key assembly, and

first and second key carrier sections each mounted to a respective one of said baseplates for pivotal motion about an individual one of a pair of axes extending substantially perpendicular to respective ones of said baseplates at adjacent rear corner portions thereof, said first and second sets of keys being respectively mounted on said carrier sections whereby each set may be adjustably positioned relative to the other about said hinged edges and about said axes.

4,597,682

IMPACT PRINT BAR ASSEMBLY

Harry B. Rooney, Laguna Hills, Calif., assignor to Reflective Technology, Inc., Scotts Valley, Calif.

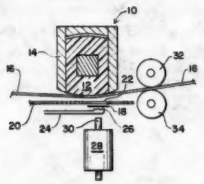
Filed Nov. 13, 1984, Ser. No. 670,987
Int. Cl.[4] B41J *11/08*
U.S. Cl. 400—656 **7 Claims**

1. An impact print bar assembly, comprising:

an impact print bar in the form of a homogeneous body portion formed about a longitudinal central support rod such that the body portion is symmetrical about two mutually perpendicular planes, said support rod extending entirely through said body portion and projecting from both ends of said print bar, one of said planes including the

central axis of said support rod, said body portion having parallel opposed side portions and opposing curved end portions, each of said end portions including two longitudinal print surfaces; and

a U-shaped bar holder adapted to receive and hold the impact bar in any one of four different orientations, said bar holder being situated in the vicinity of an impact printer device such that characters printed by the printer device are printed by impact against a different one of said print surfaces for each different orientation of the impact bar within the bar holder.



4,597,683

APPARATUS FOR APPLYING COSMETIC PREPARATIONS

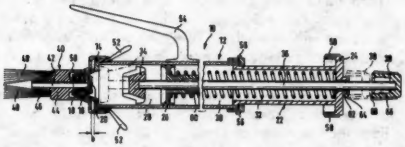
Adam Wittersheim, Mühltal, and Günter Much, Darmstadt, both of Fed. Rep. of Germany, assignors to Goldwell GmbH, Chemische Fabrik H. F. Dotter, Darmstadt-Eberstadt, Fed. Rep. of Germany

Filed Nov. 22, 1983, Ser. No. 554,564

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1982, 3243581

Int. Cl.⁴ A45D *40/10, 34/00*

U.S. Cl. 401—4 **6 Claims**



1. An apparatus for applying cosmetic preparations, in liquid or paste-like form, comprising: a closed, substantially cylindrical casing; a piston slidable in said casing, said piston dividing said casing into a first chamber and a second chamber of variable size and sealing said chambers relative to one another; said first chamber being adapted to be filled with a cosmetic preparation and to communicate with a detachable applicator, at a first end of said casing, for applying the preparation in controllable amounts; a compression spring in said second chamber urging said piston towards said first end reducing the size of said first chamber; a mixing member disposed in said first chamber; an operating stem connected to said mixing member for reciprocating said mixing member in said first chamber, said operating stem extending sealingly through said piston and extending through said second chamber; a tubular casing extension extending from said second chamber at a second end of said casing remote from said first end, said casing extension being slidable telescopically into said second chamber to a first end position, and out of said second chamber to a second end position; said casing extension having a free end; said compression spring having an end portion supported by said casing extension remote from said piston; an end cap at said free end and engageable over said second end of said casing in the first end position of said casing extension; and locking means in said end cap and on said second end of said casing, for detachably locking said casing extension to said casing at said second end when said extension is in said first end position.

4,597,684

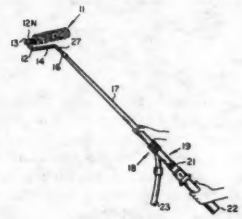
PAINTING ROLLER ASSEMBLY

Lawrence B. O'Brien, Carmel, and Walker A. Messick, Indianapolis, both of Ind., assignors to Black & Decker Inc., Newark, Del.

Filed Jun. 22, 1984, Ser. No. 623,320

Int. Cl.⁴ B05C *17/02*

U.S. Cl. 401—197 **32 Claims**



1. A roller assembly for coating a wall or the like and comprising:

core means having a plurality of relatively rigid segments fastened together in a stack having a central aperture and a longitudinal axis, said segments having grooves on external surfaces thereof;

bearing means for mounting said segments rotatably to handle means for rotation on said handle means about an axis colinear with the said axis of said stack;

a replaceable permeable cover received on the stack and covering the stack sufficiently to receive all of the coating material which passes through said grooves to the outer margins of said segments; and

at least two of said segments having screw thread means thereon threaded together to hold the segments together.

4,597,685

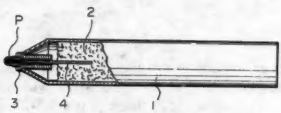
CERAMIC PEN POINT AND PEN PROVIDED THEREWITH

Noboru Nakamura, Kagoshima, Japan, assignor to Kyocera Corporation, Japan

Continuation of Ser. No. 249,128, Mar. 30, 1981, abandoned. This application May 5, 1982, Ser. No. 374,981

Int. Cl.⁴ B43K *1/00, 8/00*

U.S. Cl. 401—199 **8 Claims**



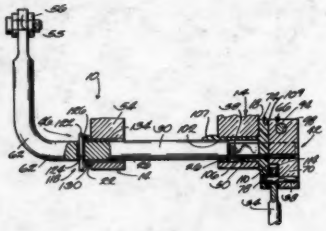
1. A ceramic pen point formed of a dense ceramic body having a small-diameter hole leading to the tip thereof, said ceramic body being composed of an aggregate of roundish fine crystals of alumina having an average crystal grain size of 1 to 80 microns.

4,597,686

QUICK RELEASE CONNECTING ASSEMBLY

H. Norman Petersen, Kenosha, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jun. 6, 1984, Ser. No. 617,972
Int. Cl.[4] F16B 1/04
U.S. Cl. 403—11 13 Claims



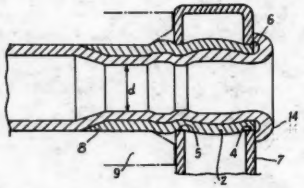
13. A connecting assembly comprising stationary support means including a side and a bore opening at said side, a first member slidable in said bore and located, in part, adjacent said support means side, a second member including an opening therein, and means adjacent said support means side for connecting said second member to said first member and comprising a first piece fixedly connected to said first member, a second piece located between said first piece and said support means side and including a bore receiving said first member for movement thereof relative to said second piece between a connect position with said first piece adjacent said second piece, and a disconnect position with said first piece spaced from said second piece, and pin means which projects from one of said first piece and said second piece and which extends into said opening in said second member when said first member is in said connect position so that said second member is secured on said pin means between said first piece and said second piece and which is withdrawable from said opening when said first member is in said disconnect position.

4,597,687

DEVICE FOR CONNECTING A TUBE AND A SHEET METAL ELEMENT

Francois Colas, 10, avenue du Petit Chambord, 92340 Bourg-La-Reine, France

Filed May 31, 1983, Ser. No. 499,791
Claims priority, application France, Jun. 3, 1982, 82 10080
Int. Cl.[4] F16B 9/00; F16L 41/00; E06C 7/08
U.S. Cl. 403—242 13 Claims



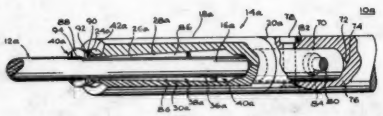
1. Device for an angular connection of a tubular shape and a double or U-shaped metal sheet element in which openings with dimensions at least equal to those of the outside section of said tubular shape where formed, characterized in that a forward portion of said tubular shape is contracted by force-fitting into a ring the outside dimensions of which are approximately equal to those of said openings and the inside dimensions of which are less than the initial outside dimensions of said tubular shape, and whose rear end is flush with the rear face of said sheet metal element, said ring being compressed by said sheet metal element between said tubular shape and said openings of said sheet metal element, while the end of said tubular shape is flanged outward in a corolla on the rear face of said sheet metal element.

4,597,688

SUCKER ROD ASSEMBLY AND METHOD

Augustine J. Pagan, El Cajon, Calif., assignor to Whittaker Corporation, Los Angeles, Calif.

Filed Sep. 17, 1984, Ser. No. 651,016
Int. Cl.[4] F16B 11/00
U.S. Cl. 403—265 20 Claims



1. An improved sucker rod assembly comprising, in combination:

a. a sucker rod; and

b. a pair of fittings secured to opposite ends of said rod, each said fitting including

i. a rigid elongated casing having interior surfaces defining an open front end and cavity extending rearwardly from said open front end in which cavity one end of said sucker rod is disposed, the side portions of said interior surfaces being contoured to define, with the side portions of said sucker rod end a single, annular elongated tapered wedge-shaped space; and,

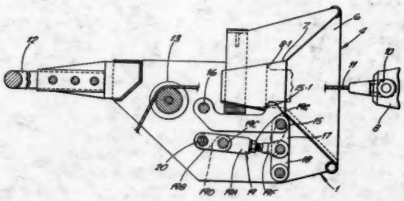
ii. anchoring means filling said space and bonding to the side portions of said rod end to lock said rod end in place, said anchoring means having a narrower diameter at the front end thereof than at about the rear end thereof and being generally frusto-conical, said anchoring means comprising a plurality of separate rigid inserts, the interior surfaces of which collectively define a central elongated passageway in which said rod end is received, said interior surfaces of said inserts being tightly bonded to said side portions of said rod, and said inserts being bonded to each other along the contact lines therebetween to form a unitary structure.

4,597,689

LATCHING MEANS

Keith J. Mitchell; Norman R. Barber, and Michael Ward, all of Kent, England, assignors to GEC Mechanical Handling Limited, England

Filed Sep. 5, 1984, Ser. No. 647,720
Claims priority, application United Kingdom, Sep. 9, 1983, 8324195
Int. Cl.[4] F16B 21/00; B63B 21/56
U.S. Cl. 403—322 8 Claims



1. An arrangement for use in providing a connection be-

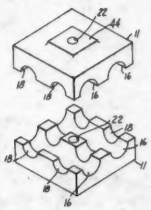
tween a cable and a moveable body comprising a latching unit incorporating means for attachment to said body, a recess and a latch capable of movement into an operating position in which a latching surface of the latch projects into the recess, the arrangement incorporating also a terminating member having means for attachment to a cable, and capable of introduction into latching position in the recess in which it is engageable by the latch, the latter being associated with locking means which holds it in the operating position and secures the terminating member against withdrawal, release means for actuating the locking means to permit the latch to move into a release position so as to allow the terminating member to be withdrawn, and inhibiting means having a position in which it secures the release means against operation, whereby release of the terminating member is prevented, and manually movable to an alternative position in which it permits operation of the release means, and thus the latch to move into the release position.

4,597,690

TUBE CLAMPS

Donald A. Girard, Rancho Cordova, Calif., assignor to Girard Development Incorporated, Rancho Cordova, Calif.

Filed Nov. 23, 1979, Ser. No. 96,809
Int. Cl.[4] F16B *2/02*
U.S. Cl. 403—391 **2 Claims**



1. A tube clamp comprising:
a pair of opposed tube engaging members,
means for clamping said members together,
each of said members being provided with a first recess to permit corresponding recesses in the two members to cooperate as a pair with each other to provide a first through opening for receiving a conduit therein,
each of said members being provided with a second recess and cooperating to form a second through opening for receiving a conduit therein, whereby
said pairs of first and second recesses may be alternatively employed to receive a conduit therein,
the outer side of each of said members being formed to provide a central boss spaced outwardly from said outer side and adapted to be received within a recess in a fixed structure.

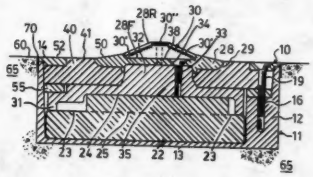
4,597,691

RETRACTABLE TRAFFIC DELINEATOR

Ronald A. W. Clarke, London, Canada, assignor to Animotion Inc., Ontario, Canada

Filed Oct. 6, 1982, Ser. No. 433,015
Claims priority, application Australia, Oct. 6, 1981, PF1070
Int. Cl.[4] E01F *9/06*
U.S. Cl. 404—11 **4 Claims**

1. A retractable traffic delineator comprising:
a hollow housing having an annular wall with an upper open end and a lower closed end,
a light reflecting member having at least one light reflecting surface,
a holder for said light reflecting member, said holder having lateral uprising portions extending forward and rearward and means therebetween positioning said reflecting member so that the lateral uprising portions are at an elevation constantly higher than the profile of the light reflecting member,
a disc-like anchor plate in the housing, the holder being mounted on a raised central portion of the anchor plate and having a peripheral portion extending around the central portion of the anchor plate in vertically spaced relation to a portion of the anchor plate surrounding the central portion, said anchor plate extending across substantially the full area of the interior of the housing,
an annular flexible water impervious membrane surrounding the raised central portion of the anchor plate and held in a water impervious manner between the holder and the



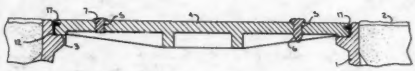
said surrounding portion of the anchor plate, the membrane extending across the interior of the housing, means securing the peripheral portion of the membrane to the wall of the housing,
biasing means between the anchor plate and the lower closed end of the housing urging the anchor plate, holder and light reflecting member upwardly,
stop means on the wall of the housing limiting upward movement of the anchor plate,
said biasing means normally urging the anchor plate against the stop means to position the light reflecting member in an operative position above the open end of the housing and permitting depression of the light reflecting member to the level of the open end of the housing.

4,597,692

REHABILITATED MANHOLE COVER

James D. Gruenwald, Menomonee Falls, Wis., assignor to Clearwater Technologies, Inc., Menomonee Falls, Wis.

Filed Jul. 12, 1984, Ser. No. 630,262
Int. Cl.[4] E02D *29/14*
U.S. Cl. 404—25 **5 Claims**



1. A manhole assembly, comprising a manhole casting defining a manhole and having an internal shoulder spaced from the upper edge of the casting, a cover to enclose the manhole and supported on said shoulder, a gasket disposed to seal the joint between the cover and the casting, a peripheral edge of said cover having a plurality of generally radial circumferentially spaced holes, and a spacing member disposed in each hole and projecting radially outward of the cover, each spacing member having an enlarged head terminating in a relative flat outer surface, said spacing members serving to accurately center the cover within said manhole.

4,597,693

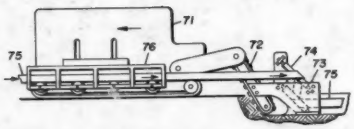
METHOD AND APPARATUS FOR INSTALLING HIGHWAY DRAINAGE MAT

Charles R. McQuary, Chesterfield, Mo., and Barry J. Dempsey, White Heath, Ill., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 480,656, Mar. 31, 1983, abandoned, and a continuation-in-part of Ser. No. 497,764, May 24, 1983, abandoned. This application Jul. 31, 1985, Ser. No. 761,217

Int. Cl.[4] E02B *11/00;* E02D *31/02;* F16L *1/02*

U.S. Cl. 405—176 4 Claims



1. A method for installing an elongated drainage mat parallel to a road in a vertical orientation under a shoulder joint comprising

(a) providing an elongated length of drainage mat comprising a water permeable fabric enveloping a core for fluid flow wherein when said mat is in a vertical orientation, said mat presents a rectangular transverse cross section with a height greater than its width;

(b) excavating an advancing trench segment adjacent to the edge of a road surface under a shoulder joint wherein said trench has a depth greater than the height of said mat;

(c) pulling a boot along the bottom of the excavated advancing trench segment, wherein said boot comprises (i) a housing having two parallel sides extending from the bottom of the trench to a height above the trench, a closed front end and open top and rear ends; (ii) a guide within said housing for horizontally pointing a vertically pointed drainage mat, said guide being positioned at an angle of about 45° from horizontal wherein the upper end of the guide is forward of the lower end of the guide so that, as the drainage mat passes around said guide, the drainage mat can directly exit to the rear of the boot; (iii) means for laterally moving the vertically-oriented mat into contact with the roadside of the trench segment; and (iv) means for filling said excavated trench segment with material excavated from the advancing trench segment to hold a drainage may against the highway side of the trench segment;

(d) feeding said length of drainage mat sequentially through the top of said boot, around said guide and out through the open rear end of the boot, wherein said drainage mat is deposited at the bottom of said excavated advancing trench segment in a vertical orientation against the roadside of the trench segment; and

(e) filling the trailing end of the excavated advancing trench segment with material excavated from the advancing trench segment to hold said drainage mat in a vertical orientation against the roadside of the trench segment.

4,597,694

DEVICE FOR INTRODUCING DOSED QUANTITIES OF PULVERIZED MATERIALS INTO A CARRIER GAS STREAM AND APPLICATION THEREOF TO A DISTRIBUTION TANK FOR PULVERIZED MATERIALS

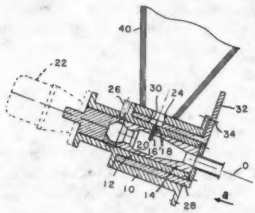
Edouard Legille, Luxembourg; Pierre Mailliet, Howald; Jeannot Loutsch, Itzig, and Jean-Pierre Welter, Grevenmacher, all of Luxembourg, assignors to Paul Wurth S.A., Luxembourg, Luxembourg

Filed Apr. 27, 1984, Ser. No. 604,465

Claims priority, application Luxembourg, Apr. 28, 1983, 84780

Int. Cl.[4] G01F *11/42;* B65G *53/46*

U.S. Cl. 406—129 10 Claims



8. A distribution tank for pulverized material and a device attached thereto for introducing pulverized materials in a carrier gas stream comprising:

housing means, said housing means having an axial flow passage for a pressurized carrier gas stream;

aperture means in said housing for delivery of pulverized material;

inner sleeve means in said housing and extending across said aperture means, said inner sleeve means having an axial bore, said bore providing a passage for the carrier gas stream;

outer sleeve means, said outer sleeve means being coaxial with said inner sleeve means and extending across said aperture means, at least one of said outer and inner sleeve means being rotatable about its longitudinal axis;

means for rotating at least one of said outer and inner sleeve means;

at least a first slot on said inner sleeve means and at least a second slot on said outer sleeve means, said first and second slots being capable of mutual overlapping alignment with each other and with said aperture to define a variable sized passage whereby pulverized material is delivered therethrough to said carrier gas stream;

valve sleeve means, said valve sleeve means being coaxial with said inner and outer sleeve means and being rotatable about its longitudinal axis, said valve sleeve means being located between said housing and said outer sleeve means, said valve sleeve means having radial aperture means corresponding to said aperture means in said housing;

means for rotating said valve sleeve means;

means for locking said valve sleeve means in at least a first angular position wherein said aperture means of said valve sleeve means and of said housing means coincide and a second angular position wherein said aperture means of said valve sleeve means and said housing means do not coincide;

wherein said inner and outer sleeve means are capable of being removed as one-piece from said housing means and said valve sleeve means, said inner and outer sleeve means being removed via translatory movement in the axial direction;

tank means for distributing pulverized materials into said aperture means of said housing means; and

said tank means including cylindrical side walls defining an interior and exterior, and a base, said base having a conical shape, the conical base extending upwardly into the interior of said tank means and wherein said aperture means of

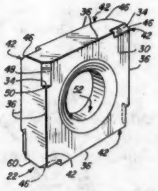
said housing means is attached to said tank means at the intersection between said sidewalls and said conical base.

4,597,695

FACE MILLING APPARATUS WITH EIGHT-EDGED INSERT

William B. Johnson, Rockford, Ill., assignor to Ingersoll Cutting Tool Company, Rockford, Ill.

Filed Mar. 11, 1985, Ser. No. 710,053
Int. Cl.[4] B23C 5/20
U.S. Cl. 407—113 2 Claims



1. An indexable, eight-position, on-edge, face-milling insert in the shape of a rectangular parallelepiped having:

a pair of parallel, generally square side surfaces; and

four generally rectangular end surfaces extending, between and perpendicular to said side surfaces, each having its minor edges perpendicular to said side surfaces;

said end surfaces each serving as a rake face of the insert in two of the indexable positions of the insert and as locator surfaces and as the axially-facing clearance surface, respectively, in others while said side surfaces serve respectively as the radially-inward-facing seating surface of the insert and the radially-outward-facing clearance surface thereof;

each end surface having a pair of diagonally-opposite compound cutting edges, one for each of said two indexable positions, each of said compound cutting edges comprising a substantial portion of that major edge of said end surface formed by its intersection with said radially-outward-facing clearance surface of the insert, a minor portion of the adjacent minor edge of said end surface formed by its intersection with said axially-facing clearance surface, and an intermediate bevel-cutting portion at the junction of said major and minor edges;

each intermediate bevel-cutting portion of each cutfing edge resulting from a plane relief surface which recedes substantially perpendicularly from said end surface for at least a minor fraction of the length of the common major edge formed by said axially-facing and radially-outward-facing clearance surfaces of the insert,

said insert having a central hole extending between its side surfaces to receive a securing fastener.

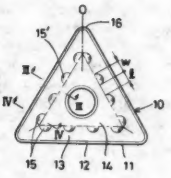
4,597,696

THROWAWAY INSERT

Jun Maeda, and Yoshikatsu Mori, both of Itami, Japan, assignors to Sumitomo Electric Industries Ltd., Osaka, Japan

Filed Mar. 20, 1985, Ser. No. 713,918
Claims priority, application Japan, Jun. 28, 1984, 59-98593[U]
Int. Cl.[4] B26D 1/00; B32B 1/04
U.S. Cl. 407—114 2 Claims

1. In a polygonal throwaway insert having a cutting edge, a land provided along and inside of said cutting edge, a breaker groove of a uniform width extending along and inside of said land, and a flat central area enclosed by said breaker groove and having a shape symmetrical to the shape of the insert, the improvement comprising a pair of projections formed at each corner of said central area so as to be symmetrical to each other with respect to a bisector of the corner, and a plurality of projections arranged at regular spacings along each of the straight sides of said central area, all of said projections having a semicircular shape extending outwardly from said central



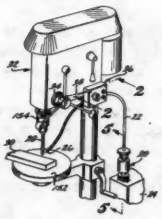
area in plan and starting from midway of said breaker groove until they become even with said central area in elevation.

4,597,697

ADJUSTABLE METERING OIL PUMP

Frank E. Shaffer, 33 Beach Dr., Newport Beach, Calif. 92663

Division of Ser. No. 399,196, Jul. 16, 1982. This application May 21, 1984, Ser. No. 612,380
Int. Cl.[4] B23B 51/06; B23C 5/28
U.S. Cl. 408—61 5 Claims



1. A switch assembly for providing an on-off signal to a pump providing fluid to a predetermined location relative to a tool and workpiece comprising:

indexing means coupled to said tool for providing an indication of operative engagement between said tool and workpiece and including:

an indexing shaft rotatable in a first and second sense responsive to advancement and withdrawal of said tool relative to said workpiece respectively, said indexing shaft coupled to said tool;

a clutch slidably coupled to said indexing shaft;

an actuating finger rotated about said indexing shaft by said clutch for indicating advance or withdrawal of said tool with respect to said workpiece; and

switching means activated by said indexing means for providing said on-off signal for said pump for a predetermined amount of withdrawl of said tool relative to said workpiece as indicated by said indexing means, whereby fluid is directed to said location by said pump for a period of time after said tool and workpiece and relatively separated in order to provide cooling and to remove chips and other debris from said tool and workpiece.

4,597,698

WALL STRUCTURE FOR MACHINE ENCLOSURES

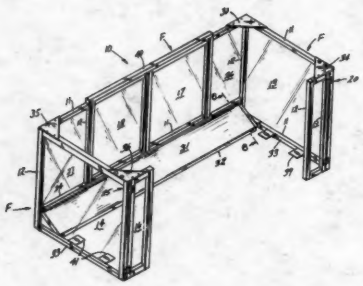
Richard E. Liebetrau, 237 Petrie Rd., Cadillac, Mich. 49601

Filed May 21, 1984, Ser. No. 612,479
Int. Cl.[4] B23C 9/00
U.S. Cl. 409—134 7 Claims

3. In an enclosure for automatic metal shaping machinery effective to contain cutting fluids, chips, shavings, broken tools

and the like, an improved wall structure providing a smooth, planar interior surface of said enclosure comprising:

a plurality of tubular elements each having a generally rectangular configuration in cross-section, said elements being connected together to define a plurality of generally rectangular, contiguous open frames, a panel of transparent sheet material overlying the inner side of each frame closing the frame, adhesive means for securing the panels to respective frames comprising a layer of tape having opposed pressure sensitive adhesive surfaces sandwiched



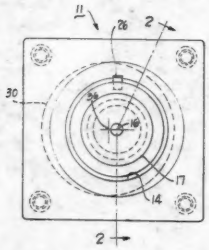
between each panel and the inner side of its mating frame to form a smooth, planar interior surface on each frame of said enclosure, a vertical axis hinge means connecting adjacent pairs of frames to provide relative motion between said frames to effect an access opening and two short return frames each connected to and perpendicular to mating side frames, the panels closing said return and side frames abutting one another snugly, said adhesive tape being the principal means for securing said panels to all said frames.

4,597,699

QUICK-CONNECT MECHANISM

Valdas S. Ramunas, Euclid, Ohio, assignor to Erickson Tool Company, Solon, Ohio

Filed Aug. 27, 1984, Ser. No. 644,640
Int. Cl.[4] B23C 5/26
U.S. Cl. 409—232 **15 Claims**



1. A quick-disconnect mechanism including a male member and a socket therefor, said socket having a longitudinal aperture disposed along an axis and adapted to receive said male member coaxial therewith, said male member having a lockable abutment surface facing in a first longitudinal direction toward the entrance of said socket;

cam means journalled in an eccentric cam follower surface on said socket for rotation about a second axis displaced from the axis of said socket;

an aperture in said cam means sufficiently large to accommodate the entrance of the lockable abutment surface on said male member;

a first diametral axis of symmetry through said cam follower surface bisecting high and low points thereof;

a conical locking surface on said cam means facing in a second longitudinal direction opposite that of said lockable abutment surface;

and means to rotate said cam means in first and second opposite rotational directions whereby rotation in said first longitudinal direction rotates said cam locking surface toward said high point of said cam follower surface to move said cam conical locking surface with a radially inward component and with a component of movement in said second longitudinal direction to engage said lockable abutment surface to lock said male member in said socket;

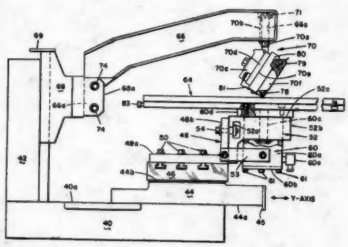
and whereby rotation of said cam in said second rotation direction unlocks said cam locking surface from said lockable abutment surface.

4,597,700

RECORD ENGRAVING APPARATUS

John C. Woolington, Harbor City, and James A. Chenoweth, Torrance, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 11, 1985, Ser. No. 690,695
Int. Cl.[4] B23D 5/02
U.S. Cl. 409—292 **20 Claims**



1. In an engraving apparatus for forming grooves of predetermined length and configuration at preselected positions relative to previously recorded record portions of a master record disc or lacquer, the apparatus having a base, a first table secured thereto for movement in a first direction relative to said base, a second table secured to said first table for movement in an orthogonal direction relative to said first table, an angularly positionable third table coupled to said second table for movement therewith, and processor means for precisely positioning the first and second tables relative to the base and for precisely angularly positioning said third table relative to said second table, the improvement comprising:

arm means coupled to said base;

cutting means on said arm means in proximate relation to said third table and positionable in a direction generally perpendicular to the plane of said third table;

means on said third table for enabling retention thereon of a generally disc-shaped master lacquer mean and plural positioning mean for positioning the center of said master lacquer means at one of at least two locations on said third table for enabling positioning of the centers of said record portions in generally proximate relation to said cutting means; and

means responsive to said processor means for enabling angular positioning of said third table and movement of said cutting means in a direction generally perpendicular to the plane of said master lacquer means for enabling engraving of grooves of predetermined depth at preselected locations relative to said prerecorded record portions on said master lacquer means in accordance with the position of said cutting means, the angular position of said third table

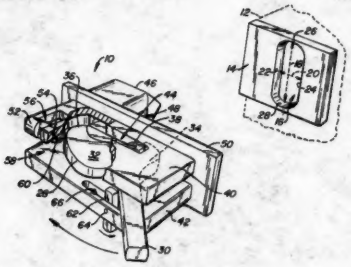
and in accordance with the positioning of said first and second tables.

4,597,701

HOOK FOR RETAINING CONTAINER CORNER CASTING

Nicklas R. DeWitt, Portola Valley, Calif., assignor to X-Ten Corporation, San Francisco, Calif.

Filed Feb. 15, 1985, Ser. No. 701,850
Int. Cl.[4] B60P 7/06
U.S. Cl. 410—84 **15 Claims**



1. A fastener for engaging a corner casting of a shipping container to secure the container to a flat support, said casting being hollow, having a planar surface abutting and parallel to said flat support, and defining through said planar surface at least one aperture, comprising:

a hook adapted to penetrate said aperture; and

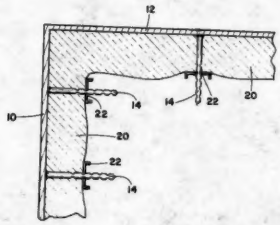
a pivot coupling said hook to said flat support, said pivot being movable parallel to said planar surface relative to said flat support to move said hook from a first position outside said corner casting to a second position of penetration of said corner casting for restraining a wall of said corner casting between said hook and said flat support, said pivot point maintaining a constant spatial interval from said pivot point to said planar surface during all positions of penetration of said hook, whereby said movable pivot allows the point of attack of said hook penetrating said aperture to be varied to match the position and orientation of said aperture without towards and away movement of said pivot point from said planar surface.

4,597,702

CLIP FOR INSULATION HANGER

Eugene N. Brown, Broken Arrow, Okla., assignor to Refractory Anchors, Inc., Broken Arrow, Okla.

Filed Feb. 21, 1984, Ser. No. 581,560
Int. Cl.[4] F16B 21/18; E04B 5/00
U.S. Cl. 411—529 **3 Claims**



1. A panel hanger assembly for attaching soft panel material such as insulation to a structural surface, said assembly comprising:

an elongated stud member having an outer end suitable for impaling a panel and an inner end attachable to a structural surface, the stud member having a substantially rectangular cross-sectional shape with opposed side walls and opposed end walls, the width between the end walls being greater than the thickness between the side walls, a plurality of pairs of opposed notches being provided in the stud end walls, each pair of opposed notches forming a stud shoulder surface at the outer end of the notches;

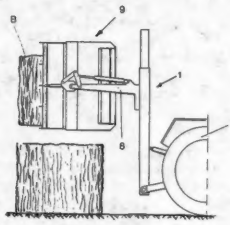
a metal retainer clip having a flat inner surface and a generally flat outer surface and being of generally uniform thickness less than the length of said notches and having an aperture therein, the aperture having a first portion adjacent one edge of the clip of dimensions to freely receive said stud, the aperture having a second portion adjacent to and communicating with said first portion, said second portion having a width which is greater than the width of said stud at a said pair of notches but which is less than the normal width of said stud measured between said end walls, portions of said outer surface adjacent both sides of said aperture second portion being outwardly bent to provide locking surfaces opposite said aperture first portion, and said aperture having a third portion contiguous to and communicating with said second portion, said third portion being of width less than the normal width of said stud end walls and greater than the width between opposed notches, whereby said clip can be inserted onto a said stud by passing said stud through said aperture first portion to a selected pair of notches, after which said clip can be moved laterally relative to said stud, said stud at a pair of notches passing past said aperture second portion and into said aperture third portion without rotation of said clip, said stud shoulder surfaces engaging said clip and said clip being retained in a non-rotatable position by said clip locking surface.

4,597,703

BALE HANDLING AND HAY DISTRIBUTING APPARATUS

Mauro Bartolini, Borgo San Lorenzo, Italy, assignor to Agrimac di Bartolini Mauro, Borgo San Lorenzo, Italy

Filed Jun. 11, 1984, Ser. No. 619,222
Claims priority, application Italy, Jun. 13, 1983, 9455 A/83
Int. Cl.[4] A01D 87/12
U.S. Cl. 414—24.6 **13 Claims**



9. Apparatus for handling round-bales of hay or the like and for distributing said hay material, said bales being formed of at least one layer of the hay spirally wound about a central axis, comprising:

a round-bale holder of elongated generally U-shaped cross-section for supporting therewithin a round bale of hay;

vertically movable fork-lift means having a pair of parallel elongated arms for supporting said bale holder, said bale holder being pivotally supported by said pair of arms at a pivot axis approximately mid-length of said bale holder;

means for rotating the bale around its central axis within said holder, when said holder is in a hay dispensing position, said bale rotating means comprising two endless conveyors arranged in end-to-end relation, inclined and converging;

a shredding unit for said hay within said holder, and means to activate said shredding unit when said bale is rotated about its central axis within said holder while in the dispensing position, said shredding unit comprising a rotating

shaft and a plurality of shredding blades radially extending therefrom and located between said endless conveyors;

the central axis of the bale, the length of said holder and said parallel elongated arms of said lift means all being generally parallel to one another in said dispensing postion; and

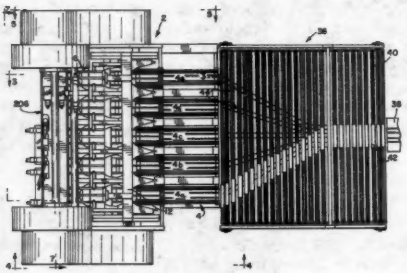
means for rotating said bale holder with respect to said lift means about said pivot axis from said dispensing position 90° to a first bale loading position wherein said holder is generally vertically disposed to pick up vertically disposed bales, and to a second bale loading position disposed 180° from said dispensing position.

4,597,704

STACK HANDLING METHOD AND APPARATUS

Andrew H. Vedvik, Poynette, and Myron J. Merdler, Monona, both of Wis., assignors to Oscar Mayer Foods Corporation, Madison, Wis.

Division of Ser. No. 306,461, Sep. 28, 1981, Pat. No. 4,478,024.
This application Sep. 20, 1984, Ser. No. 652,785
Int. Cl.[4] B65H *31/40*
U.S. Cl. 414—28 **26 Claims**



25. An apparatus for aligning the slices in stacks of sliced food products to permit insertion of the stacks into container cavities, the apparatus comprising:

a stack support surface disposed to receive stacks from an upstream stack supply conveyor;

means to detain a stack received from the supply conveyor on the upstream end portion of the support surface;

a stack former downstream of the detaining means and movable between a stack engaging position and a stack release position, the stack former having a stack engaging surface disposed to engage the front edge portion of a stack to urge any misaligned slices into alignment; and

a stack positioning member movable along the stack support surface to engage a rearward edge portion of the detained stack to push the stack into engagement with the stack former while simultaneously engaging a front edge portion of an upstream stack on the supply conveyor to retard its movement of the upstream stack onto the support surface wherein the stack positioning member includes means for simultaneously pushing an aligned stack past the stack former to a further downstream position wherein the further downstream station is a stack loading station and wherein the loading station comprises a pedestal disposed to receive a stack from the stack support surface.

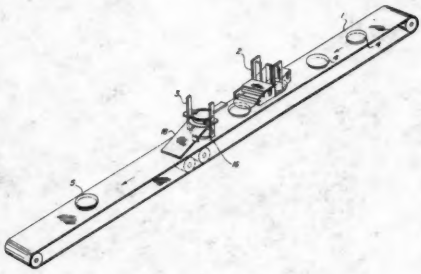
4,597,705

AUTOMATIC STACKER

Fred Scheeler, Northfield, and David C. Eisendrath, Evanston, both of Ill., assignors to Colborne Manufacturing Company, Glenview, Ill.

Filed Jun. 22, 1984, Ser. No. 623,383
Int. Cl.[4] B65G *57/30*
U.S. Cl. 414—30 **5 Claims**

1. An automatic stacking machine for stackable articles which have a generally horizontal margin at each of opposite sides, said machine comprising an inverted U-shaped structure the legs of which straddle a conveyor means for delivering an article to be stacked to a fixed location between said legs, means on said machine for positioning a conveyor delivered article at said location, article lifting means projecting toward said location from each of said legs at a level to engage an article below its margin at said location, article holding means projecting from said legs in the direction of said lifting means and at a stacking position above and vertically aligned with



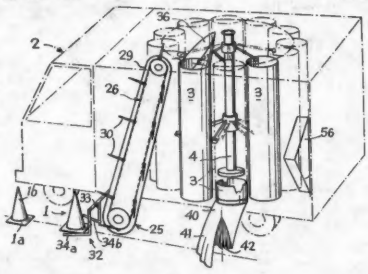
said lifting means, means for operating said lifting means to engage the margin of and raise an article to above the level of said holding means, means to retract said holding means to pass said article and said lifting means and to then return the holding means to its initial projected position, and means for retracting said lifting means at the stacking position to deposit a lifted article onto said holding means and to then return the retracted lifting means to a level below and outwardly of the margin of an article at said fixed location and at that level return the lifting means to its initial position.

4,597,706

PROCESS AND MACHINE TO MECHANICALLY PICK UP, STORE AND PLACE HOLLOW CONE MARKERS USED AS LANE GUIDES

Emile J. Michit, 24, rue de la Poste, 13690 - Graveson, France

Filed Nov. 23, 1984, Ser. No. 674,502
Claims priority, application France, Dec. 13, 1983, 83 20084
Int. Cl.[4] B65G *57/03, 59/10, 59/12, 65/06*
U.S. Cl. 414—30 **10 Claims**



1. A machine for mechanically picking up, storing and transporting hollow conical road markers, said machine being mounted on a vehicle, comprising a plurality of vertically supported cylindrical containers, each being open at both ends, a vertical shaft rotatably supported on said vehicle, a plurality of arms extending radially outwardly from said vertical shaft and supporting said container, a conveyor-elevator means extending downwardly from said vehicle, just above a road surface, for picking up the road markers when the vehicle moves along a line of road markers, said conveyor-elevator

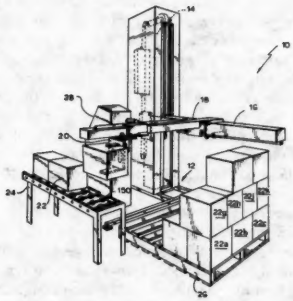
means including a driven continuous chain, a plurality of spaced articulated projections supported on said chain, and aligning and tipping-over means for directing a base of each road marker for engagement with one of said projections on said chain, whereby each marker is picked up by one of said projections and moved by said chain for deposit in a selected container.

4,597,707

AUTOMATIC OPERATING PALLETIZER

Vincent Cornacchia, Paramus, N.J., assignor to General Machine Design, Inc., Palisades Park, N.J.

Filed Aug. 17, 1984, Ser. No. 642,032
Int. Cl.[4] B65G *57/24*
U.S. Cl. 414—62 **17 Claims**



1. An automatically operating palletizer comprising an independent, fixed and stationary vertical support column; a horizontally positioned support beam, means for movably mounting said horizontal support beam on said support column for vertical movement in a fixed vertical plane relative to said support column; a horizontally extending product support beam; means for movably mounting said product support beam on said horizontal support beam perpendicularly to the horizontal support beam for movement along the length of the horizontal support beam; a product carrier slidably mounted on said product support beam for movement along the length of the support beam; drive means for driving said horizontal support beam and said product support beam to a plurality of vertical and horizontal positions respectively relative to said support column, and means for driving said product carrier along said product support beam; said drive means for driving the product support beam and said means for driving the product carrier each comprising a rack respectively mounted on the horizontal support beam and on the product support beam, pinion means respectively engaged with said racks and first and second electric drive motors for driving the respective pinions thereby to position said product carrier at any of a plurality of predetermined positions in a three dimensional volume to move products from one position to any of a plurality of other positions in space.

4,597,708

WAFER HANDLING APPARATUS

William R. Wheeler, Saratoga; Rusmin Kudinar, Fremont; George J. Kren, Los Altos, and David D. Clementson, Palo Alto, all of Calif., assignors to Tencor Instruments, Mountain View, Calif.

Filed Jun. 4, 1984, Ser. No. 616,979
Int. Cl.[4] B65G *1/06*
U.S. Cl. 414—331 **15 Claims**

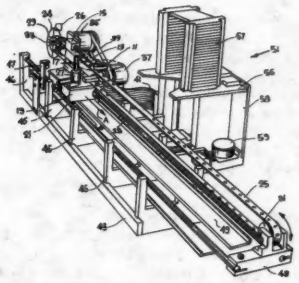
1. A wafer and disk handling apparatus comprising,

a wafer chuck mounted on a horizontally extending boom capable of rotating about a vertical axis, said wafer chuck capable of supporting a wafer in a releasable manner, said boom normally oriented in a first direction by means of a biasing element,

an upright arm supporting said boom along said vertical axis of rotation, said boom supported at a first position along the length of the arm,

guide means connected to the upright arm at a second position along the length of the arm for turning said arm to a plurality of directions,

carriage means movable along a predefined path for supporting the upright arm,



means associated with said predefined path for actuating said guide means at selected locations along the path, for selectively causing said turning of said arm,

motor means for moving said carriage means past said selected locations, and

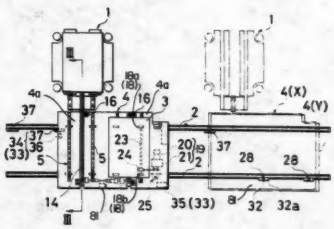
a wafer elevator disposed adjacent to said predefined path, said elevator having means for supporting a spaced wafer stack at an elevation for wafer transfer with said wafer chuck.

4,597,709

TRANSFERRING DEVICE FOR DIES AND THE LIKE

Keitaro Yonezawa, Itamishi, Japan, assignor to Aioi Seiki K.K., Itamishi, Japan

Filed Aug. 1, 1983, Ser. No. 518,961
Int. Cl.[4] B65G *67/24*
U.S. Cl. 414—401 **4 Claims**



1. A transferring device for dies and the like comprising rails, car, stopper means and stopping control means, wherein:

said rails, a pair of front and rear rails, are laid on the floor in parallel;

said car has on its topside at least one seat for dies and the like, at least one of said wheels of said car is arranged to be driven by a car drive gear, and said wheels riding on one rail are flanged, while those riding on the other rail are plain without flange;

said stopper means comprises a stopper pin, stopper pin driving means and a stopper plate, of which said stopper pin and said stopper pin driving means are provided either on the underside of said car on the side of said the other

rail or on the fixed side of that rail or the floor in its vicinity, and said stopper plate on the other, said stopper pin is vertically movable by said stopper pin driving means, and said stopper plate is provided with a mating hole so that said car can be stopped at the predetermined stop position by engaging said stopper pin in said mating hole;

said stopping control means comprises a detection means which detects said car when it has reached the start-to-stop position in the vicinity on either, left or right, side of said predetermined stopping position and a stop commanding means, said stop commanding means acts on said detection signal from said detection means to stop said car drive gear, and at the same time said stopper pin is advanced by said stopper pin driving means toward said stopper plate so as to engage in the mating hole; and

as the car starts to stop, said car is caused to rotate slightly with its inertia force around the center of said stopper pin so that said flanges of said flanged wheels on the one rail come into frictional contact with the sides of said rail, thus said car is stopped softly without shock.

4,597,710

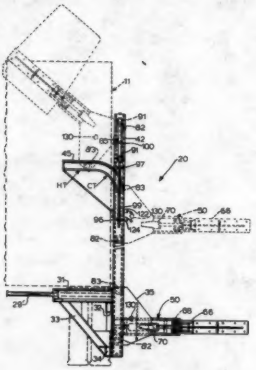
TRASH COLLECTION VEHICLE SIDE-LOADING APPARATUS

Lawrence H. G. Kovats, Raleigh, N.C., assignor to Athey Products Corporation, Wake Forest, N.C.

Filed Nov. 28, 1984, Ser. No. 675,958

Int. Cl.[4] B65G *67/04*

U.S. Cl. 414—409 **3 Claims**



1. Apparatus for grasping, lifting and tipping a trash loaded container into a receptacle on a side-loading trash collection vehicle and thereafter lowering and releasing the container, comprising:

(a) a frame mounted below said receptacle;

(b) means for moving the frame laterally with respect to said receptacle;

(c) a pair of opposed upwardly extending laterally spaced guide rails supported on each side of and movable with said frame and having:

(i) the tracks of one pair opposing the tracks of other pair;

(ii) the lower ends of both pairs supported on said frame;

(iii) a first member of each pair providing a continuous flat surfaced vertical track throughout its length; and

(iv) a second member of each pair providing a continuous flat surfaced track the major portion of which is vertical and laterally opposite the track of the first member of the same pair and having an upper end minor portion providing a curved track as a continuation of said second member vertical track and as a continuation of said curved track a horizontal track, said curved and horizontal tracks being directed toward an opening in the top of said receptacle and located at a level below the upper end of said first member of the same pair;

(d) a traveling carriage having a pair of outwardly extending pivotal container gripping arms disposed horizontally when resting at the bottom of said side rails, a first set of upper rollers mounted for traveling and during traveling to be always confined on the tracks of the said second members of said pairs of guide rails and a second set of lower rollers mounted for traveling and during traveling to be always confined on the tracks of the said first members of said pairs of guide rails;

(e) a pair of hydraulic cylinder actuated means mounted on said carriage for moving said gripping arms in and out to grip and release said container at a position spaced outwardly from said rails;

(f) operator-controllable fluid actuated piston/cylinder means operatively associated with and adapted for lifting and lowering said carriage along said guide rails whereby when said carriage is raised by said lifting means to the extent of the stroke of said piston/cylinder means, said carriage and gripping arms are pivoted and the container carried thereby is upended while remaining in the grasp of said arms as said upper set of rollers are guided onto said curved and horizontal tracks of said guide rail second members followed by said lower set of rollers being guided to the top of said guide rail first members to reside above said upper rollers; and

(g) carriage reversing means comprising:

(i) contact means adapted for being operatively engaged by upward movement of said carriage and while engaged moving with each said lower roller traveling on each said first rail member during a terminal portion of the upward travel thereof; and

(ii) spring means operatively associated with said contact means and compressed in coordination with upward travel of said contact means whereby when said piston/cylinder means starts said carriage on a return travel release of the compression of said spring means acts to force said upper rollers to travel on respective said horizontal and curved tracks and force the lower roller to return downwardly ahead of and to lead said upper rollers traveling on said second member tracks during the initial stage of said return travel; and

(h) adjustable means for controlling the fluid supply to said piston/cylinder means in coordination with lifting, tilting and lowering of said carriage enabling the speed of said carriage to be reduced as it approaches, tilts, and leaves the upper limits of its travel.

4,597,711

DEVICE TO FACILITATE CHANGING TIRES

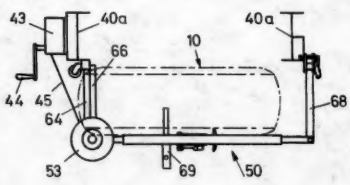
Hanne Liebermann, Erbstrasse 2a, 8700 Kusnacht, Switzerland

Filed Jan. 11, 1984, Ser. No. 569,859

Claims priority, application Switzerland, Jan. 13, 1983, 183/83

Int. Cl.[4] B62D *43/04*

U.S. Cl. 414—427 **10 Claims**



1. An arrangement for facilitating changing tires on a vehicle, comprising a tire holder having means for supporting a tire

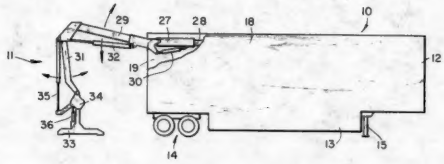
in the holder, wheel means for rolling the holder with a tire therein on the ground and means for raising or lowering the tire supporting means relative to the wheel means, means for independently and stably supporting the tire holder in a vertical position on the ground; pivoted handle means, said pivoted handle means being pivotally attached at its opposite ends to the holder and to one side of the vehicle, said pivoted handle means being detachably secured at one of its ends to one of said holder and said vehicle, said pivoted handle means allowing vertical shifting of the tire holder while the upper portion of the tire holder is engaged to the vehicle, the tire holder having an operating length from the wheel means to said upper portion of the holder such that a distance between the ground and the point of attachment of the holder with the vehicle is at least equal to the operating length of the holder; and means operable on another side of the vehicle for lifting a lower end of the holder and for holding the holder in a generally horizontal orientation under the vehicle with the upper portion of the tire holder engaged to the vehicle, the tire holder being pivotable from a generally horizontal storage position beneath the vehicle to a vertical position on one side of the vehicle while the upper portion of the tire holder is attached to the vehicle.

4,597,712

TRAILER APPARATUS FOR TRANSPORTING VEHICLES AND OTHER CARGO

Earl D. Smith, Scottsdale, Ariz., assignor to Dallas Smith Engineering Corporation, Phoenix, Ariz.

Filed Aug. 1, 1983, Ser. No. 519,388
Int. Cl.[4] B60P *1/00*
U.S. Cl. 414—549 **10 Claims**



1. A trailer apparatus for transporting vehicles and other cargo, which comprises:

an enclosed body including upstanding side walls, a front wall, a floor, a top and a rear end opening;

door means mounted to the rear end of said body for closing the rear end opening of said body;

wheel means connected with said body for carrying said body along a support surface;

hitch means connected with said body for connecting said body with a towing vehicle;

support means mounted within said body for supporting several vehicles within said body, said support means further being for supporting at least one vehicle in a position above a second vehicle within said body; and

powered means mounted within said trailer for loading vehicles from outside of said body to within said body and in position upon said support means, said powered loading means further being for lifting vehicles upwardly from an outside surface and for moving vehicles longitudinally of said body to a position within said body;

said powered loading means including arm means for grasping vehicles outside of said body and for lifting the vehicles for loading into said body and carriage means for moving vehicles longitudinally of said body into position within said body, said arm means including a pair of arm assemblies, each of said arm assemblies including a lifting arm means for lifting a vehicle from below the floor of the body to a position at least as high as the floor of said body, a translating arm means for moving a vehicle longitudinally of said body relative said carriage means, and a clamping arm means for grasping the vehicle for permitting carrying of the vehicle by said lifting arm means and said translating arm means,

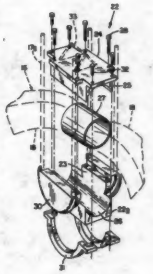
each of said pair of arm assemblies including a primary arm pivotally connected with said carriage means, primary power means for pivoting the primary arm with respect to said carriage means, a secondary arm pivotally connected with the primary arm, secondary power means for pivoting the secondary arm with respect to the primary arm, a clamping arm pivotally connected with the secondary arm and clamping power means for pivoting the secondary arm with respect to the secondary arm.

4,597,713

SHOVEL DIPPER BAIL ASSEMBLY

Terry L. Briscoe, Portland, and Rebecca A. H. VanRaden, Beaverton, both of Oreg., assignors to Esco Corporation, Portland, Oreg.

Filed Apr. 29, 1985, Ser. No. 728,326
Int. Cl.[4] E02F *3/40*
U.S. Cl. 414—690 **6 Claims**



1. A shovel dipper bail assembly comprising

a U-shaped bail adapted to be pivotally secured to a dipper, said bail having a pair of legs integral with a connecting bight, said bight centrally of the length thereof having a cylindrical section, and

a lifting hitch for said dipper adapted to be cable-connected to a sheave-equipped boom, said hitch including a U-shaped bracket rotatably engaging said cylindrical section, said bracket having a pair of arms, cable sheave means mounted on said arms, and a closure connected between said arms to confine said bight cylindrical section within said hitch.

4,597,714

ROBOT GRIPPER FOR INTEGRATED CIRCUIT LEADFRAMES

Barry L. Morrison, Bedford, and James W. Tolson, Dallas, both of Tex., assignors to Thomson Components - Mostek Corporation, Carrollton, Tex.

Filed Mar. 22, 1984, Ser. No. 592,161
Int. Cl.[4] B25J *15/00*
U.S. Cl. 414—729 **6 Claims**

1. Apparatus for gripping a thin flexible object located substantially in a gripping plane having a transverse axis and a longitudinal axis, said transverse and longitudinal axes being perpendicular to each other and to a linear axis perpendicular to said gripping plane comprising:

first and second sets of gripper claws gripping said object, said sets of gripper claws being located on opposite sides of said longitudinal axis and having a closed position for gripping said object and an open position for releasing said object;

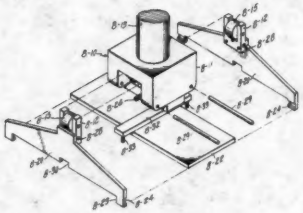
means for restricting the motion of said gripper claws in a direction perpendicular to said longitudinal axis, so that

said gripper claws approach said longitudinal axis no closer than a predetermined transverse distance;

means for moving said griper claws inwardly to said predetermined transverse distance to define a gripping volume bounded by said gripping claws in said gripping plane along said transverse axis and bounded in a direction parallel to said linear axis by top and bottom volume bounding means; and

means for moving said gripper claws outwardly from said predetermined transverse distance to release said object;

said bottom volume bounding means comprising a lower projection portion of said first and second sets of gripper



claws extending inwardly toward said longitudinal axis to a lower predetermined distance less than said predetermined transverse distance, said gripper claws further including an upper projection portion extending inwardly toward said longitudinal axis;

said means for restricting the motion of said gripper claws comprising a planar member located between said upper and lower projection portions of said gripper claws and having a lower surface disposed above said gripping plane along said linear axis, whereby said gripping volume is defined by said lower surface, said lower projection portions and said griping claws.

4,597,715

WOODEN WIND TURBINE BLADE MANUFACTURING PROCESS

Clint Coleman, Warren, Vt., assignor to North Wind Power Company, Inc., Moretown, Vt.

Division of Ser. No. 379,631, May 19, 1982, Pat. No. 4,465,537. This application May 21, 1984, Ser. No. 612,411

Int. Cl.[4] F03D *1/06*

U.S. Cl. 416—229 R **8 Claims**

1. A laminated wooden rotor blade having a flatbottomed air foil, comprising

a two-sided tapered laminate composed of compression bonded parallel layers of wood having a convex side in a predetermined contour to which all of the layers of wood are approximately parallel over the entire length of the blade and a flat twisted side, the surface of which at any point along the length of the blade is rectilinear in cross section but of varying orientation along the length of the blade according to a predetermined twist schedule, said flat side cutting across the laminae of said blade to reveal the parallel edges thereof.

4,597,716

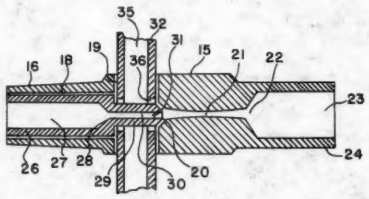
AIR ACTIVATED VACUUM PUMP

Edward Evenson, Chicago, Ill., assignor to Milton Industries, Inc., Chicago, Ill.

Filed Jun. 22, 1984, Ser. No. 623,577

Int. Cl.[4] F04F *5/44*

U.S. Cl. 417—181 **4 Claims**



1. A hand held thumb regulated vacuum pump comprising:

(a) an elongated cylindrical body of a size to be held between the fingers of a hand and provided at one end with a recessed inlet port and at its opposite end a recessed exhaust port,

(b) an internal fluid passage having a diameter less than said recessed inlet and outlet ports and extending axially of said body to provide open communication between said inlet port and said exhaust port,

(c) a cross bore extending through said inlet port adjacent to one end of said fluid passage,

(d) a hollow branch projected into said cross bore and through said inlet port adjacent said fluid passage, sealing said cross bore to either side of said inlet port,

(e) said hollow branch transpierced along its midline so as to provide a cross opening having a diameter smaller than that of said recessed inlet port and greater than that of said fluid passage,

(f) a channeled plug positioned in said inlet port providing a needle-like nose projecting through the transpierced hollow branch and terminating adjacent to one end of said fluid passage,

(g) said fluid passage providing a converging entrance in communication with said cross opening of said hollow branch and into which said needle-like nose of said channel plug porjects so as to direct a fluid medium therethrough and into said recessed exhaust port, and

(h) an open cap for said recessed exhaust port, closable by the thumb of the hand holding said vacuum pump for regulating the passage of vacuum induced fluid therethrough.

4,597,717

TWO-STAGE FLUID PUMP

Gregory J. Mohr, Hartland, Wis., assignor to Truline C.N.C., Inc., Brookfield, Wis.

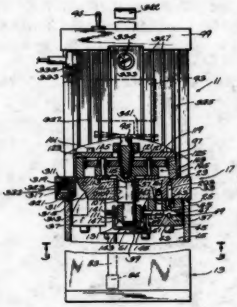
Filed Sep. 30, 1982, Ser. No. 431,015

Int. Cl.[4] F04B *35/04, 27/04, 23/02*

U.S. Cl. 417—265 **9 Claims**

1. A two stage fluid pump comprising a base member defining a sump, a first fluid pumping unit including a pumping piston and supply and discharge passages, a second fluid pumping unit including a pumping piston and supply and discharge passages, a plate member fixed on said sump and having mounted thereon said first and second fluid pumping units, said plate member including a first conduit communicating with said first unit discharge passage and with said second unit supply passage, a second conduit communicating with said second unit discharge passage and terminating in a discharge port, an undersurface, a face in which said discharge port terminates, a return conduit terminating, at one end, in a return port locating in said face in adjacent relation to said discharge port and terminating, at its other end, in an outlet port in said

undersurface, a first discharge conduit terminating, at one end, in a first center port located in said face adjacent to and in laterally spaced relation from said discharge port on one side thereof, and, at its other end, in a first remote port located in said face in laterally spaced relation from said first center port, and a second discharge conduit terminating at one end, in a



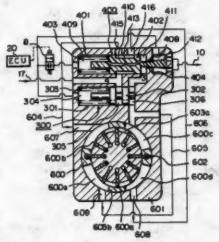
second center port located in said face adjacent to and in laterally spaced relation from said discharge port on the other side thereof, and, at its other end, in a second remote port located in said face in laterally spaced relation from said second center port, and a drive engaged with said pistons for effecting reciprocation thereof.

4,597,718

HYDRAULIC FLUID SUPPLY SYSTEM WITH VARIABLE PUMP-DISPLACEMENT ARRANGEMENT

Hiromichi Nakano; Hideaki Sasaya, and Mitsuo Inagaki, all of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jun. 5, 1985, Ser. No. 741,582
Claims priority, application Japan, Jun. 6, 1984, 59-116830
Int. Cl.[4] F04B *49/08*
U.S. Cl. 417—300 **9 Claims**



1. A hydraulic fluid supply system for supplying a controlled amount of hydraulic fluid under pressure to a hydraulic actuator, which comprises:

(a) pumping means, including a plurality of independent pumping chambers, for delivery of high-pressure hydraulic fluid, said pumping chambers including at least a first and a second pumping chambers;

(b) a high-pressure fluid supply circuit having a first end in fluid receptive relationship with said pumping chambers and a second end in fluid transmitting relationship with said hydraulic actuator;

(c) a first feed conduit for feeding a low-pressure fluid to said first pumping chamber;

(d) a second feed conduit in fluid communication with said second pumping chamber;

(e) a variable orifice provided in said supply conduit for generating variable pressure differences across said orifice, said variable orifice being operable between a first position providing a predetermined cross-sectional flow area and a second position in which the flow area thereof is reduced;

(f) a flow control valve positioned in said supply conduit upstream of said variable orifice and responsive to the pressure difference developed across said orifice to control the flow rate of the high-pressure fluid flowing therethrough at constant values depending on the pressure difference;

(g) a switching valve for selectively connecting said second feed conduit to said first feed conduit or to said supply conduit, said switching valve having a first position in which said second feed conduit is communicated with said first feed conduit for feeding the low-pressure fluid to said second pumping chamber and a second position in which said second feed conduit is communicated with said supply conduit for feeding the high-pressure fluid to said second pumping chamber, said switching valve being operatively interconnected with said variable orifice in such a manner that on movement of said switching valve from said first position to said second position thereof said variable orifice moves from the first position thereof to the second position;

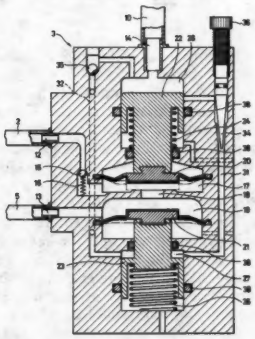
(h) electrically operable drive means for shifting said switching valve from said first position to said second position thereof together with said variable orifice, thereby connecting said second feed conduit to said high-pressure supply conduit and reducing the cross-sectional flow area of said variable orifice, whereby a part of the high-pressure fluid pumped out by the first and second pumping chambers is returned back to said second pumping chamber by bypassing the hydraulic actuator thereby disabling said second pumping chamber to reduce the effective overall displacement of said pumping means, said flow control valve operating at the second position of said variable orifice to control the fluid flowing through said orifice toward the actuator to flow at reduced flow rates.

4,597,719

SUCK-BACK PUMP

Terukuni Tano, Tokyo, Japan, assignor to Canon Kabushiki Kaisha and Canon Hanbai Kabushiki Kaisha, both of Tokyo, Japan

Filed Mar. 26, 1984, Ser. No. 593,704
Claims priority, application Japan, Mar. 28, 1983, 58-50506
Int. Cl.[4] F04B *9/00*
U.S. Cl. 417—317 **7 Claims**



1. A suck-back pump for preventing any additional amount of liquid from dropping out of an outlet of a delivery pipe, by

drawing the liquid within the delivery pipe, said suck-back pump comprising:

an inlet port for receiving liquid;

an outlet port to be placed in communication with said delivery pipe;

a first chamber communicating with said inlet port;

a second chamber communicating with said outlet port;

a flow passage for connecting said first chamber with said second chamber;

a shut-off valve for opening and closing said flow passage;

suction means for changing the volume of said second chamber;

a first piston for moving said shut-off valve;

a second piston for moving said suction means;

a first cylinder slidably receiving said shut-off valve moving piston;

a second cylinder slidably receiving said suction means moving piston;

a first flow passage for supplying pressurized fluid to said first cylinder for said shut-off valve moving piston to move the piston therein, and

a second flow passage for connecting said first cylinder for said shut-off valve moving piston with said second cylinder for said suction means moving piston for supplying pressurized fluid from the former to the latter, said second flow passage being constructed to connect said first and second cylinders with each other when said shut-off valve moving piston moves through a predetermined distance.

4,597,720

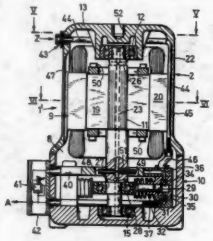
CLEANING APPARATUS FOR THE WET CLEANING OF BUILDING WALLS AND FLOORS, SWIMMING POOLS, AUTOMOBILES AND THE LIKE

Ingo H. Friedrichs, Kahlen Brink 13, 4952 Porta Westfalica, Fed. Rep. of Germany

Continuation of Ser. No. 60,845, Jul. 26, 1979, abandoned. This application Jul. 27, 1981, Ser. No. 287,060

Int. Cl.[4] F04B *35/04, 39/06*

U.S. Cl. 417—368 **20 Claims**



1. A cleaning apparatus for wet cleaning of walls or floors of buildings and the like by means of a high-pressure jet of a relatively cold washing liquid, comprising a housing; an electromotor including a stator and an armature; a pump having a drive driven by said electromotor and operative for generating said high-pressure jet, said electromotor and said pump being accommodated in said housing, said housing being filled with an electrically non-conductive coolant to such a level that said pump and said electromotor are located below said level, said coolant contained in said housing constituting an operating space; a shaft having an upper end and a lower end and carrying said armature and extending through said operating space, said drive being mounted on said lower end and axially offset relative to said armature; means for conducting said washing liquid within said housing, said conducting means being exposed to said coolant which is continuously cooled in heat exchange relationship with the washing liquid; and means for circulating said coolant within said housing including a central suction passage formed in said shaft and extended in an axial direction thereof up to said upper end and at least one cross bore also formed in said shaft at the upper end thereof and communicating with said passage, said circulating means at least indirectly causing the continuous forced circulation between cold and heated coolant in said operating space.

4,597,721

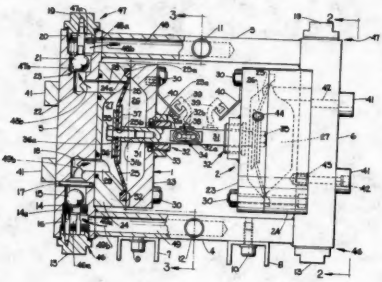
DOUBLE ACTING DIAPHRAGM PUMP WITH IMPROVED DISASSEMBLY MEANS

Richard A. Santefort, Hamilton, Ohio, assignor to Valco Cincinnati, Inc., Cincinnati, Ohio

Filed Oct. 4, 1985, Ser. No. 784,241

Int. Cl.[4] F04B *17/00*

U.S. Cl. 417—393 **16 Claims**



1. A double-acting air-powered diaphragm pump comprising:

a manifold assembly having inlet and outlet manifold members, said inlet manifold having a fluid inlet port, said outlet manifold having a fluid outlet port;

first and second diaphragm pump assemblies positioned in spaced relationship, each of said pump assemblies having a cavity-like pump chamber, a resilient web-like diaphragm positioned within said pump chamber to define an air chamber and a fluid chamber, and a shaft member having one end attached to the central portion of said diaphragm;

said manifold assembly further including first connecting means for permitting fluid flow from said inlet port to said fluid cavity when said diaphragm moves so as to increase the volume of said fluid cavity, and second connecting means for permitting fluid flow from said fluid cavity to said outlet port when said diaphragm moves so as to decrease the volume of said fluid cavity;

means for removably attaching said pump assemblies to said manifold assembly so that said diaphragms are substantially parallel and said shaft members are substantially co-axial;

means for pivotally and detachably connecting said other ends of the shaft members to cause the shaft members to reciprocate together; and

means for pressurizing and exhausting air from each of said air chambers so as to alternately increase and decrease, respectively, the volume of said air cavities to cause fluid to be moved from the inlet port to the outlet port, whereby said pump assemblies can be easily and individually removed from said pump.

4,597,722

LONG-STROKE DOWNHOLE PUMP

James B. Tichy, P.O. Box 1308, Sausalito, Calif. 94966

Filed Mar. 22, 1985, Ser. No. 715,228

Int. Cl.[4] F04B *47/08*

U.S. Cl. 417—404 **1 Claim**

1. An improved double-acting pump of the type including: a pump body defining an engine chamber capable of receiv-

ing a drive fluid and a pump chamber capable of receiving and discharging a production fluid, said engine and pump chambers being axially-spaced apart;

an engine piston mounted to reciprocate within the engine cylinder under force of the drive fluid; and

a pump piston mounted within the pump chamber and mechanically coupled to the drive piston to reciprocate therewith;

whereby the fluid to be pumped is drawn into and discharged from the pump chamber;

said improvement being an improved means for mechanically coupling the engine and pump pistons comprising:

a tension member running axially through both the pump chamber and the engine, tension member being fixed to the pump body in the pump chamber and terminating in a floating piston in the engine chamber, whereby pressure in the engine chamber exerts a tensile force on the tension member; and

a connector sleeve slidably mounted on the tension member and having the pump piston mounted at one end thereof and the engine piston mounted at the other end thereof, whereby the tension member prevents buckling of the sleeve under compression.

4,597,723

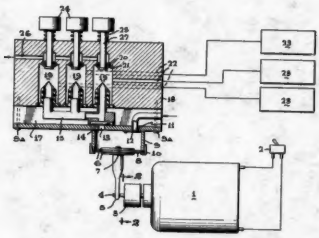
LOW PRESSURE AIR SUPPLY AND CONTROL SYSTEM

Joseph A. Sember, Jasco Products, Inc., P.O. Box 10236, Glendale, Calif. 91209, and Joseph A. Sember, III, 4330 Berkshire Ct., Oxnard, Calif. 93030

Filed Jun. 7, 1982, Ser. No. 385,611

Int. Cl.[4] F04B *21/00, 39/10;* F16K *15/14*

U.S. Cl. 417—440 **3 Claims**



1. A low pressure air supply and control system comprising:

(a) a motor having a rotary output shaft;

(b) means for converting rotary motion of said output shaft to linear reciprocating motion; and

(c) an air pump having

(1) a variable volume pumping chanber having a reciprocating wall connected to said means for converting rotary motion to reciprocating motion;

(2) an input port in fluid communication with said pumping chamber;

(3) a one way valve permitting fluid flow from said input port into said pumping chamber;

(4) an outlet passage in a fluid communication with said pumping chamber;

(5) a one way valve means permitting fluid flow out of said pumping chamber through said outlet passage;

(6) a discharge chamber in fluid communication with said outlet passage, said discharge chamber having a discharge passage in fluid communication therewith;

(7) an exhaust passage in fluid communication with said discharge chamber; and

(8) a depressurization valve normally biased into closed position selectively connecting said discharge chamber to said exhaust passage; said one way valve means permitting fluid flow through said outlet passage comprising a duckbill elastomeric valve affixed to a discharge end of said outlet passage located in said discharge chamber.

4,597,724

SCROLL TYPE FLUID DISPLACEMENT APPARATUS WITH CENTRIFUGAL FORCE BALANCEWEIGHT

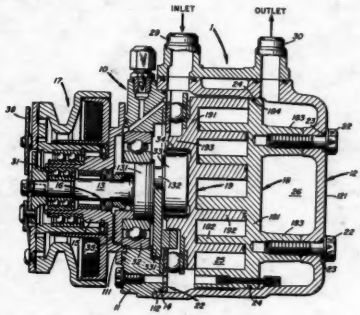
Tadashi Sato, and Kiyoshi Terauchi, both of Gunma, Japan, assignors to Sanden Corporation, Gunma, Japan

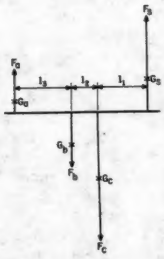
Filed May 24, 1984, Ser. No. 613,418

Claims priority, application Japan, May 24, 1983, 53-90993

Int. Cl.[4] F01C *1/04, 17/06, 21/00*

U.S. Cl. 418—55 **6 Claims**





1. In a scroll type fluid displacement apparatus including a housing having a fluid inlet port and a fluid outlet port, a fixed scroll fixedly disposed relative to said housing and having first end plate from which a first wrap extends, an orbitng scroll having second end plate from which a second wrap extends,

said first and second wraps interfitting as an angular offset to make a plurality of line contacts to define at least one pair of sealed off fluid pockets, a driving mechanism including a drive shaft rotatably supported by said housing and drive pin eccentrically extending from an inner end of said drive shaft, linkage means separate from said drive shaft for drivingly connecting said drive pin to said orbiting scroll, said orbiting scroll being moved through said linkage means in orbital motion with line contact between said first and second wraps by the rotation of said drive shaft, rotation preventing means for preventing the rotation of said orbiting scroll during its orbital motion, and said linkage means being swingable about said drive pin, the improvement comprising said linkage means having a first balanceweight which causes a centrifugal force which is slightly larger than the centrifugal force which arises by orbiting motion of said orbiting scroll and the parts of the apparatus which orbit with said orbiting scroll to improve the wearing of said wraps due to radial contact between said wraps.

4,597,725

ROTARY PISTON MACHINE WITH PARALLEL INTERNAL AXES

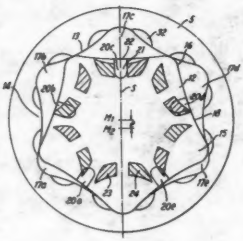
Hans C. Petersen; Svend E. Thomsen, and Hans L. Hansen, all of Nordborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Continuation of Ser. No. 550,257, Nov. 10, 1983, abandoned. This application Jan. 17, 1985, Ser. No. 692,189

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1982, 3243404

Int. Cl.[4] F01C *21/12, 1/10*

U.S. Cl. 418—61 B **8 Claims**



1. A rotary piston machine comprising, a housing, inlet and outlet passage means, oppositely facing wall means in said housing, meshing externally and internally toothed gerotor type star and ring gears which rotate and gyrate relative to each other and form expanding and collapsing chambers therebetween, said gears being between said wall means in sealing engagement therewith, said gears having parallel axes which define a line of eccentricity with the axis of a moveable one of said gears being gyrateable relative to the axis of the other of said gears, shaft means for turning said moveable gear relative to the other of said gears, means for supplying fluid to and exhausting fluid from said chambers on opposite sides of said line of eccentricity, said ring gear having convexed shaped teeth with bottom sections between said teeth thereof, said star gear having teeth with tooth crests having convex curved sections which mesh in sealing engagement and constant physical contact with said teeth of said ring gear, and said ring gear having at least on one axially facing side thereof recess passages recessed in an axial direction spaced apart on opposite circumferential sides of each of said bottom sections which connect adjacent ones of said chambers only on each side of said line of eccentricity.

4,597,726

SCREW COMPRESSOR HAVING TWO INDIVIDUALLY DISPLACEABLE REGULATING SLIDES

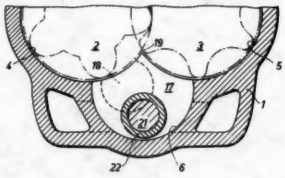
Frits Söderlund, Saltsjöbaden, and Kurt Karlsson, Tyresö, both of Sweden, assignors to Svenska Rotor Maskiner Aktiebolag, Stockholm, Sweden

Filed May 8, 1985, Ser. No. 731,886

Claims priority, application Sweden, May 11, 1984, 8402563

Int. Cl.[4] F01C *1/18*

U.S. Cl. 418—201 **8 Claims**



1. A screw compressor compsriing:

male and female screw rotors (2,3) which are journalled for mutual meshing engagement in a housing (1) which encloses a respective working chamber (4,5) for each of the rotors, the housing (1) being provided with a low-pressure side wall, a high-pressure side-wall (20), an inlet port and an outler port;

a single axial recess (6) in said housing (1) which includes a continuous part of walls of the working chambers (4,5) of the two rotors, said single axial recess extending out through at least said high-pressure side-wall (20); and

two slides (17,18; 27,28) arranged for mutually independent axial movement in said single axial recess (6) for respectively regulating the built-in volume ratio and the capacity of the compressor;

one of said slides (18;28), which regulates the capacity of the compressor, having a flank which forms a wall of the working chamber (4) of solely one of said rotors, said one of said slides (18;28) not directly communicating with the working chamber of the other of said rotors.

4,597,727

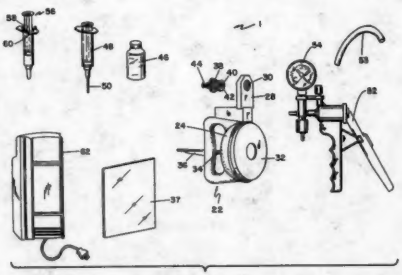
WINDSHIELD REPAIR KIT

Robert R. Birkhauser, III, Madison, Wis., assignor to A.G.S., Inc., Madison, Wis.

Continuation-in-part of Ser. No. 470,440, Feb. 28, 1983, abandoned. This application Jan. 10, 1984, Ser. No. 569,753

Int. Cl.[4] B29C *45/14*

U.S. Cl. 425—12 **15 Claims**



1. A kit for repairing windshield breaks comprising the combination of:

(a) a repair assembly (22) adapted to be secured against a windshield (10) over a windshield break (18);

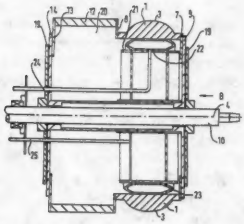
(b) a mirror (37) adapted to be placed against a windshield (10) on the side of the windshield (10) opposite the repair assembly (22);
(c) a screw (38) having a lengthwise cylindrical opening (40) and adapted to be positioned in the repair assembly (22) perpendicular to the windshield (10) over the windshield break (18);
(d) a gasket (42) attached to the end of the screw (38) next to the windshield (10) and adapted to form a generally fluid-tight seal with the windshield (10) when the screw (38) is tightened down on the windshield (10);
(e) a repair material (46) adapted to fill in windshield breaks (18);
(f) a repair material applicator adapted to fit into the cylindrical opening (40) of the screw (38);
(g) a vacuum pump (52) for applying negative pressure to the windshield break (18) area and adapted to attach to the screw (38) in substantially fluid-tight relation
(h) a pressure syringe (56) for applying positive pressure to the windshield break (18) area and adapted to attach to the screw (38) in substantially fluid-tight relation;
(i) the pressure syringe (56) having a notched handle (58); and
(j) a clip (60) to engage the notched handle (58) so as to maintain the pressure on the windshield break (18) at a given level.

4,597,728

APPARATUS FOR THE MANUFACTURE OF PNEUMATIC TIRES

James N. McGlashen, Near Wigan, England, assignor to Apsley Metals Limited, London, England

Filed Feb. 3, 1984, Ser. No. 576,578
Claims priority, application United Kingdom, Feb. 24, 1983, 8305084
Int. Cl.[4] B29H *5/04*
U.S. Cl. 425—23 **3 Claims**



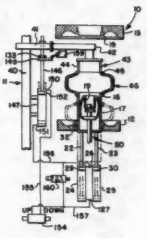
1. Apparatus for consolidating an annulus of uncured elastomeric tread compound for a pneumatic vehicle tire, said annulus being located radially inwards of a patterned annular tread mould, said apparatus comprising in combination:
(a) a set of rigid segments arranged in sliding engagement to form a consolidation ring and radially movable between a first diameter for positioning of the segments radially inwardly of the annulus of tread compound in said tread mould and a second diameter at which the segments form a smooth continuous consolidating surface,
(b) mechanical means for moving the segments radially a relatively long distance from the first diameter substantially to said second diameter without applying substantial outward radial pressure, and
(c) fluid inflatable means slidably movable from a position along side the rigid segments to a position radially and axially within the rigid segments to apply radial outward pressure evenly around the radially inner surface of the consolidation ring of segments to move the segments a relatively short distance to bring them completely to the second diameter and to apply consolidation pressure to the annulus.

4,597,729

TIRE CURING PRESS AND LOADER

Anand P. Singh, Youngstown, and Norman R. Knoedler, Salem, both of Ohio, assignors to NRM Corporation, Columbiana, Ohio

Filed Sep. 23, 1985, Ser. No. 778,886
Int. Cl.[4] B29H *5/02*
U.S. Cl. 425—38 **33 Claims**



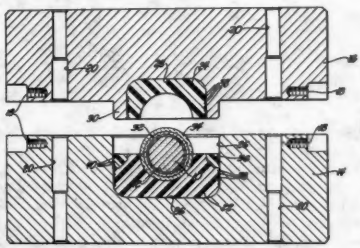
1. A tire press having top and bottom mold sections and a loader therefor, said tire press including a fluid power operated vertically movable bottom bead ring, said loader including means to move a green tire vertically in alignment with said bottom bead ring, when elevated and fluid power control means operative to synchronize the movement of said bottom bead ring and the loader after the loader has positioned the green tire with its bottom bead in close proximity to the bottom bead ring, said fluid power control means comprising a synchronizer piston-cylinder assembly and piston-cylinder means operative to move said bottom bead ring, and fluid passage means directly interconnecting said synchronizer piston-cylinder assembly and said piston-cylinder means causing said synchronizer piston-cylinder assembly and said piston-cylinder means to act together to cause the green tire and bottom bead ring to move downwardly in unison.

4,597,730

ASSEMBLY FOR HOT CONSOLIDATING MATERIALS

Walter J. Rozmus, Traverse City, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Division of Ser. No. 419,435, Sep. 20, 1982, abandoned. This application Jan. 16, 1985, Ser. No. 692,060
Int. Cl.[4] B30B *11/00*
U.S. Cl. 425—78 **11 Claims**



1. An assembly for hot consolidating material (10) of metallic and nonmetallic compositions and combinations thereof to form a densified compact (10') of a predetermined density wherein a quantity of such material (10) which is less dense

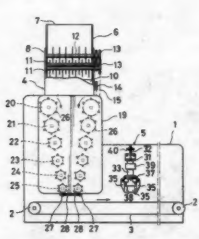
than the predetermined density is heated and disposed in a cavity in a pressure-transmitting medium (22, 24) to which external pressure is applied to the entire exterior of the medium (22, 24) to cause a predetermined densification of the material (10) by hydrostatic pressure applied by the medium (22, 24) in response to the medium being substantially fully dense and incompressible and capable of elastic flow at least just prior to the predetermined densification, characterized by a ram (16) of incompressible material, a pot die (14) made of incompressible material having a pot die cavity (26) therein with peripheral surfaces for receiving and sliding engagement with the exterior surfaces of said ram (16), the pressure-transmitting medium being elastomeric and being defined by first (22) and second (24) components, said first component (22) of said elastomeric medium being disposed within a cavity (26) in said pot die (14), said second component (24) of said elastomeric medium being acted upon by said ram (16), said ram (16) being movable into and out of said cavity (26) in said pot die (14) in close sliding engagement therewith, said first and second elastomeric components (22, 24) and said ram (16) and pot die (14) being configured so that said ram (16) enters said cavity (26) of said pot die (14) prior to said elastomeric components (22, 24) engaging one another, a formed thermal insulating barrier means (32, 34) for surrounding the material (10) and disposition within the cavity of the elastomeric medium (22, 24) to establish a thermal barrier between the material (10) and the elastomeric medium (22, 24) so that the material (10) may be heated prior to placing the thermal barrier means (32, 34) within the cavity defined by the first (22) and second (24) components of elastomeric medium and applying pressure to the medium (22, 24) to crumble the thermal barrier means (32, 34) surrounding the material (10) to limit heat transfer between the material (10) and the elastomeric medium (22, 24) whereby the first and second components (22, 24) of the elastomeric medium are successively opened and closed upon the opening and closing of the ram and pot die respectively in a press to successively form a plurality of densified compacts with a plurality of formed barrier means.

4,597,731

FOOD SHAPING APPARATUS

Kisaku Suzuki, 1-19-8, Toshida, Nerima-ku, Tokyo, Japan

Filed Mar. 29, 1985, Ser. No. 717,422
Claims priority, application Japan, Apr. 4, 1984, 59-50252[U]
Int. Cl.⁴ B29C *43/00*
U.S. Cl. 425—204 **8 Claims**



1. A food shaping apparatus for shaping a material of a food into a foodstuff, comprising:

a hopper for introducing said material thereinto;

conveyor means for conveying said introduced material;

loosener means for loosening the material which is being conveyed by said conveyor means;

scraper means for scraping the loosened material;

a casing for operatively supporting the conveyor means, loosener means and scraper means, said casing being at its top connected with a bottom of the hopper;

a pair of plates located one behind the other and to face each other at a predetermined spacing;

a plurality of pairs of rollers journalled to laterally opposite sides of said plates with a spacing which progressively decreases from a top pair down to a bottom pair;

a plurality of vanes axially mounted on the periphery of each of said rollers; and

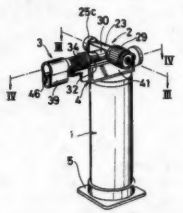
cutter means located below said bottom pair of the rollers for cutting a predetermined amount or length of the material.

4,597,732

BURNER DEVICE

Sadao Yoshinaga, Ichikawa, Japan, assignor to Prince Industrial Development Co., Ltd., Tokyo, Japan

Filed Jul. 2, 1985, Ser. No. 751,373
Claims priority, application Japan, Jul. 7, 1984, 59-102553
Int. Cl.⁴ F23Q *7/12*
U.S. Cl. 431—255 **6 Claims**



1. A burner device comprising a fuel tank and body having a size capable of being gripped by hand, and a valve device, a combustion device and an ignition device which are connected to an upper portion of said body; said valve device having a passage to which fuel is supplied from said body, said passage being provided with a control member varied by a flow control member and an opening and closing needle valve; said combustion device comprising a nozzle supporting member connected to the side of the valve device and in communication with the passage, a nozzle pipe whose rear end is connected to said nozzle supporting member and bored with an air intake hole opened and closed by an air control cylinder rotatably and retractably fitted while permitting a coiled spring to act, and a nozzle head fitted into a nozzle tip at the extreme end of said nozzle pipe to form a passage into a main passage and a sub-passage; and said ignition device comprising a piezo electronic unit within a casing connected to the body, and an operating member which is moved along with a movable member of said piezo electronic unit to move forward said air control cylinder, said ignition device being electrically connected to a discharge electrode provided at the end of the combustion device and being directed at said nozzle head.

4,597,733

GAS HEATING SYSTEM FOR DEHYDRATORS AND THE LIKE

Alvin Dean, Box 336, Bloomfield, N. Mex. 87413, and Rodney T. Heath, 109 W. 31st St., Farmington, N. Mex. 87401

Filed Feb. 14, 1985, Ser. No. 701,753
Int. Cl.⁴ F23Q *9/00*
U.S. Cl. 431—285 **7 Claims**

1. A gas heating system for oil and gas processing equipment or the like comprising:

a main gas burner means for supplying heat to the oil and gas processing equipment;

a pilot light burner means mounted in juxtaposition to said main gas burner means for continuously providing a flame for ignition of said main gas burner means;

a housing means for enclosing said main gas burner means and said pilot light burner means therewith;

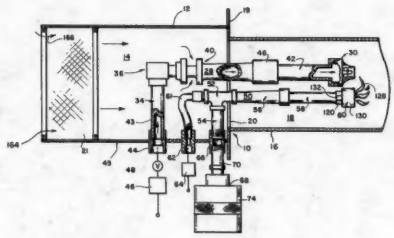
a main burner air-gas supply means at one end of said hous-

ing means for supplying combustion air and gas to said main gas burner means;

a combustion chamber means at the opposite end of said housing means for burning an air-gas mixture therewithin:

stack means connected to said combustion chamber means for receiving products of combustion therefrom;

pilot primary air-gas supply means separate from said main burner air-gas supply means and being connected only to said pilot light burner means for supplying pilot light primary combustion air and gas only to said pilot light burner means separately and independently of said main burner air-gas supply means;



means for automatically reigniting said air-gas issuing from said pilot light burner means in the event said flame should be extinguished comprising:

a pilot burner ignition tip means mounted on the end of said air-gas mixture passage means for continuously burning the air-gas mixture and maintaining a pilot flame adjacent said main gas burner means; and

a sleeve means mounted circumjacent said pilot burner ignition tip means for protecting said pilot flame and for serving as a heat sink means for receiving and storing sufficient heat during operation of said pilot burner means to reignite said pilot burner means in the event of flame blowout.

4,597,734

SURFACE-COMBUSTION RADIANT BURNER

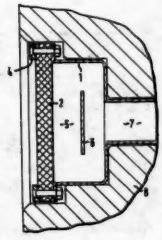
Dominick A. C. McCausland; Leslie C. Shirvill, and Kenneth F. Coles, all of Chester, United Kingdom, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 4, 1985, Ser. No. 707,727

Claims priority, application United Kingdom, Mar. 5, 1984, 8405681

Int. Cl.⁴ F23D *14/12*

U.S. Cl. 431—328 **6 Claims**



1. A surface-combustion radiant burner comprising a frame of impermeable material supporting a porous element which is permeable to gas and has a front surface for producing radiant heat and conduit means for conducting a combustible gas mixture into a gas distributing space enclosed by the frame and into and through the porous element for effecting combustion near its front surface, wherein the porous element is formed of metal fibers of an alloy containing 15.0 to 22.0% w chromium, 4.0 to 5.2% w aluminum, 0.05 to 0.4% w yttrium, 0.2 to 0.4% w silicon, less than 0.03% w carbon and the balance iron and having the property of forming an alumina layer on being heated in the presence of oxygen.

4,597,735

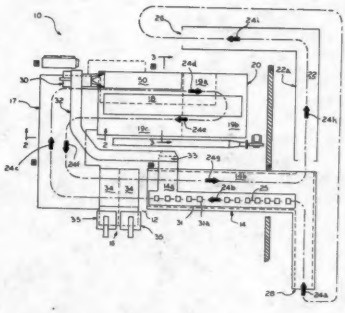
HIGH-EFFICIENCY PORCELAIN ENAMELING FURNACE

Roger B. Deline, Port Colborne, Canada, assignor to Can-Eng Holdings, Ltd., Canada

Filed Aug. 5, 1985, Ser. No. 762,691

Int. Cl.⁴ F24C *3/00*; F27D *3/00, 15/00*; F27B *5/14*

U.S. Cl. 432—11 **18 Claims**



10. A method for fusing a porcelain coating onto a piece of ware, said method comprising the steps of:

passing said ware sequentially through a heat transfer section, a pre-heating zone, a heating zone and a heat exchanger zone;

transferring heat from outgoing ware to incoming cool ware in the heat transfer section by radiation and convection;

passing combustion gases into U-shaped radiant tubes in the heating zone to heat said ware by radiation;

collecting said combustion gases outside of said heating zone;

passing said collected combustion gases from said heating zone into U-shaped heat exchanger tubes in said pre-heating zone for pre-heating said ware by radiation;

passing said combustion gases from said pre-heating zone to said heat exchanger zone for initially heating of the incoming ware by convection; and

exhausting said combustion gases from said heat exchanger.

4,597,736

METHOD AND APPARATUS FOR HEATING SEMICONDUCTOR WAFERS

William Moffat, Sunnyvale, Calif., assignor to Yield Engineering Systems, Inc., Sunnyvale, Calif.

Filed May 3, 1985, Ser. No. 729,911

Int. Cl.⁴ F27B *3/22, 5/04*; C23C *14/00, 16/00*

U.S. Cl. 432—26 **9 Claims**

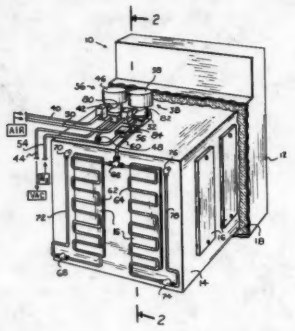
1. A method for heating semiconductor wafers comprising:

placing at least one wafer within a chamber of an oven;

evacuating said chamber;

preheating a quantity of an inert gas by causing said inert gas

to move past a heating element of said oven which is external to said chamber;



releasing said quantity of preheated inert gas into said previously evacuated chamber; and

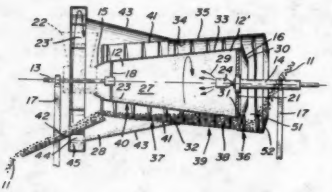
applying heat energy to said inert gas within said chamber.

4,597,737

METHOD AND APPARATUS FOR DRYING OR HEAT TREATING GRANULAR MATERIAL

Vijaya G. S. Raghavan, and Kulbir Pannu, both of Ste. Anne de Bellevue, Canada, assignors to McGill University, Quebec, Canada

Filed Aug. 17, 1984, Ser. No. 641,610
Int. Cl.[4] F27B *15/00, 7/14*
U.S. Cl. 432—197 **13 Claims**



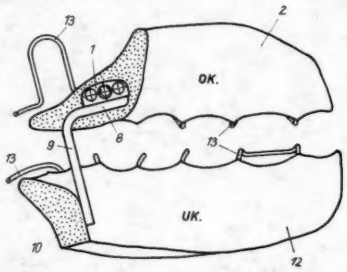
1. A drying apparatus for drying granular material fed thereto in a continuous flow, said apparatus comprising a conical heating drum having an inlet end and an outlet end, heating means in said container, conveying means in said container adjacent said inlet end to displace a particulate medium capable of retaining heat from said inlet end to a heat chamber within said conical heating drum, shower means in said heat chamber for displacing said particulate medium for direct contact with a flame during a predetermined time so that said medium is quickly heated to an approximate desired temperature, a mixing and drying conical drum disposed entirely about said conical heating drum and having an inlet end and outlet end, auger means in said mixing and drying conical drum for conveying said heated particulate medium discharged from said outlet end of said heating drum with a humid granular material introduced at said inlet end of said mixing and drying conical drum, whereby to dry said material by heat transfer between said particulate medium and said granular material, said mixing and drying conical drum having a dryer section and a separator section, said dryer section being disposed in a portion of its inlet end, said separator section being disposed in a portion adjacent its outlet end and having a particulate medium extractor element and a granular material conveyor, an annular cone-shaped trough secured about said drum separator section and rotated therewith, whereby to recycle said particulate medium while still hot, means to recover said dried granular material and drive means drivingly coupled to impart rotation to all said conical drums and conveying means.

4,597,738

ORTHODONTIC DEVICE

Günter Sander, Ulm, and Rolf Förster, Pforzheim, both of Fed. Rep. of Germany, assignors to Bernhard Forster GmbH, Pforzheim, Fed. Rep. of Germany

Filed Mar. 6, 1985, Ser. No. 708,709
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1984, 3411852
Int. Cl.[4] A61C *3/00*
U.S. Cl. 433—7 **9 Claims**



1. In an orthodontic device for effecting a sagittal displacement of upper and lower jaws relative to each other, comprising

an upper jaw thrust plate adapted to be secured to upper teeth,

a lower jaw thrust plate to be secured to lower teeth,

slideways provided on one of said thrust plates, and

activating rods carried by the other of said thrust plates and inserted in said slideways in sliding contact therewith for effecting said sagittal displacement,

the improvement residing in that

said other thrust plate comprises two laterally spaced apart sections and

a jackscrew mechanism which connects said two sections and is operable to transversely move said two sections relative to each other,

said jackscrew mechanism comprising two nut bodies each of which is secured to one of said sections, each of said activating rods being carried by a respective one of said two nut bodies.

4,597,739

TOW ELEMENT BRACKET SYSTEM FOR TRUE STRAIGHT WIRE ORTHODONTICS

Farel Rosenberg, 10535 Wilshire Blvd. #1811, Los Angeles, Calif. 90024

Filed May 21, 1985, Ser. No. 736,252
Int. Cl.[4] A61C *3/00*
U.S. Cl. 433—16 **5 Claims**

1. A two piece adjustable bracket system for straight wire orthodontic treatment comprised of:

(a) a series of bracket support bases individually contoured on one side to permit bonding to each tooth, each bracket support base being of a thickness to establish, with its tooth, a vertical faces which together with the corresponding vertical faces of other bonded bracket support bases creates a symmetrical archform which compensates for the width and contour variations of the teeth to which they are bonded;

(b) a series of rectangular working brackets each containing a plurality of archwire slots;

(c) a coupling means integral with each bracket support base and with each working bracket rigidly, but detachably,

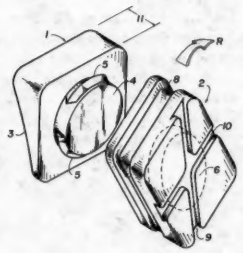
joins a support base to a bracket in a flush fit and having means for attaching said bracket to said support base in any of four angular positions;

whereby the following improved treatment procedure may be carried out:

a bracket support base having a tooth side contour conforming in both horizontal and vertical direction, and of proper width and height is bonded to each tooth;

a working bracket having archwire hodling means particularly suited for the type of orthodontic movement required of that tooth is coupled to the corresponding bracket support base in any chosen one of four possible positions by use of the said coupling means;

a flexible archwire is positioned in and held to a desired working bracket to produce simultaneously the desired in-out, up-down, rotation, torque and angulation tooth movements needed to bring all the teeth into the alignment required without the need for archwire bending and rebonding of the bracket support base, while allowing subsequent changes in any of the said tooth movements to be rapidly and conveniently made.



4,597,740

METHOD FOR SIMULATION OF A VISUAL FIELD OF VIEW

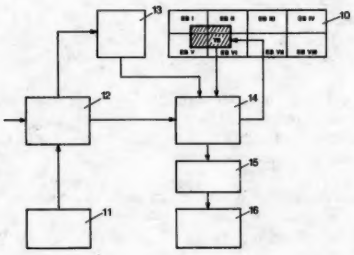
Robert Stickel, Neu Isenburg, Fed. Rep. of Germany, assignor to Honeywell GmbH, Offenbach, Fed. Rep. of Germany

Filed Nov. 19, 1982, Ser. No. 443,093

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1981, 31338895

Int. Cl.⁴ G09B 9/00

U.S. Cl. 434—20 **6 Claims**



1. Method for simulation of a visual field of view, whereat for training of a battle situation the image of a background is displayed on a TV monitor in the field of view of the optics of a person to be trained and the image of a moveable target is cut in in that background and whereat the image of the background as well as the image of the target are digitally stored and are displayed after conversion into a video signal, characterized in that the gray scale levels of a daylight video picture of the background image point by image point are converted with a factor given by an evaluation function in order to produce a display according to a thermal image.

4,597,741

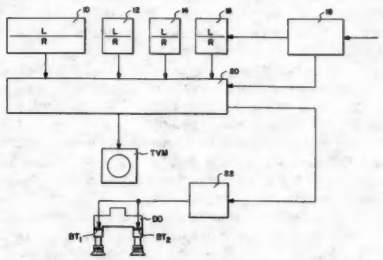
APPARATUS FOR SIMULATION OF A FIELD OF VIEW

Robert Stickel, New Isenburg, Fed. Rep. of Germany, assignor to Honeywell

Filed Apr. 9, 1984, Ser. No. 597,945

Int. Cl.⁴ G09B 9/00

U.S. Cl. 434—27 **4 Claims**



1. Apparatus for simulating a field of view for battle training purposes having first means for digitally storing half images of various battle field objects and second means for converting the digitally stored images to video images in an interlaced scanning manner to display images on a television monitor for viewing by a spectator through an optical system, the improvement comprising:

means producing first and second half images of a stereoscoptic index mark for storage in said first means, so as to simulate the appearance of a stereoscopic range meter when interlaced by said second means and viewed through the optical system; and

control means for controlling the image displacement of the half images of said index mark as a function of range, the optical system providing that each half image of the index mark be viewed in two light paths separately by each eye of the spectator.

4,597,742

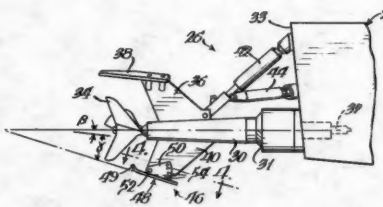
TRIMMING ARRANGEMENT FOR PLANING HULLS

Charles W. Finkl, 2011 Southport Ave., Chicago, Ill. 60614

Filed Mar. 29, 1982, Ser. No. 362,706

Int. Cl.⁴ B63H 21/26

U.S. Cl. 440—61 **7 Claims**



1. An improved marine drive system for a planing hull comprising:

drive housing means adjustably mounted on the stern of said planing hull by a ball and socket mount extending aft of the stern transom,

steering means for pivoting said housing means laterally of said hull about said mount,

trimming means for pivoting said housing means vertically of said hull about said mount,

a propeller drive shaft rotably carried by said housing means and having a screw propeller adapted to operate in a partially submerged condition for propelling said planing hull through water, and

trim means mounted on said housing means below said drive shaft and positioned forward of said screw propeller, said trim means consisting of a hydrofoil whereby a downward force component is exerted on said drive housing during forward movement of said hull through water so that the stern of said hull is urged downward.

5. An improved trimming arrangement for a planing hull, comprising:

submerged foil means mounted on the stern transom of said hull said foil supported from one side and positioned forward relative to a drive housing means for selective adjustable movement with respect thereto,

said foil means having a configuration creating a downward force component which acts upon the stern of said planing hull during forward movement of said hull through water,

means for pivotally mounting said foil means on said hull, actuator means operatively connected with said foil means for selectively varying the angular dispostion of said foil means to vary the resultant downward force component created thereby,

said foil means comprise a pair of hydrofoils respectively pivotally mounted on opposite sides of the stern of said planing hull and extending rearwardly thereof,

said actuator means comprise a pair of actuators respectively operatively connected with said hydrofoils for selected movement thereof,

each of said hydrofoils includes a generally planar first portion disposed generally horizontally, and a generally vertically disposed second portion disposed generally perpendicular to said first portion,

a pair of trim plate means pivotally mounted on respective opposite sides of the stern of said planing hull,

said actuators being respectively operatively connected to said pair of trimplate means for selected pivotal movement thereof,

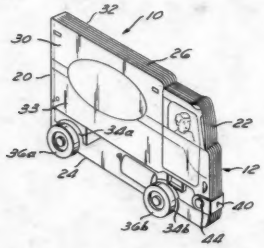
and said hydrofoils being respectively affixed to said pair of trim plate means.

4,597,743

FREE-STANDING ROLLING BOOK FOR CHILDREN

James Becker, 145 Hart Ave., Santa Monica, Calif. 90405, and Andrew S. Mayer, 747 Gayley Ave., Apt. 3, Los Angeles, Calif. 90024

Filed Apr. 18, 1985, Ser. No. 724,776
Int. Cl.[4] A63H *00/00*
U.S. Cl. 446—71 **12 Claims**



1. A free-standing rolling book comprising:

plural sheets, bound along one marginal edge to form said book, said sheets including a front cover and a back cover with interior pages therebetween;

printed matter, disposed on the exterior of at least one of said covers, depicting a moving object having support locations, said support locations disposed adjacent a bottom marginal edge of said at least one of said covers;

plural wheels, for supporting said sheets in a free-standing position when all of said sheets are vertical and in contact with adjacent sheets such that said book is in a closed upright position, at least some of said wheels disposed at respective support locations depicted by said printed matter; and

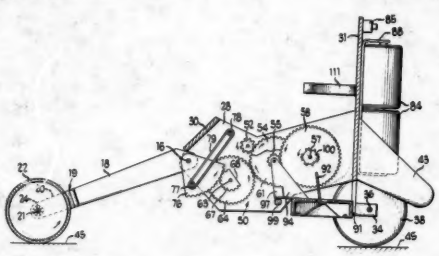
means for individually, rotatably, cantilever mounting said wheels along respective axes passing through the covers of the book such that said wheels project outwardly in cantilever fashion from said front and back covers to permit said book to be opened to expose the interior pages thereof, said wheels being mounted in positions so related to the center of gravity of said book and being configured to provide a wheel span, between the outer edge of a wheel mounted on said front cover and the outer edge of a wheel mounted on said back cover, measured in a direction normal to said covers, such that said mounting and configuration enable the rotatably mounted wheels to support said sheets in said free-standing position to permit said book to roll without external support.

4,597,744

SELF-PROPELLED TOY

Steven F. Rehkemper, Chicago, and Harry Disko, South Barrington, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 10, 1984, Ser. No. 579,144
Int. Cl.[4] A63H *11/12, 5/00, 17/16, 17/25*
U.S. Cl. 446—278 **20 Claims**



1. A self-propelled toy comprising:

a single rigid front section with opposed ends;

a single rigid rear section with opposed ends;

means mounting a wheel for free-wheeling rotation in a forward direction about an axis adjacent one end of each section;

means restricting the rotation of at least one of the wheels to the forward direction;

the axes adjacent the one end of each section being spaced apart and substantially parallel;

a pivot axle;

means connecting the other end of each section for pivotal movement about the same pivot axle;

the pivot axle being intermediate and substantially parallel to the wheel axes;

reciprocating pivotal movement of the sections about the pivot axle alternately increasing and decreasing the distance between the wheel axes causing the toy to move forwardly;

means biasing at least one section about the pivot axle and means driving at least one section about the pivot axle in opposition to the bias; and

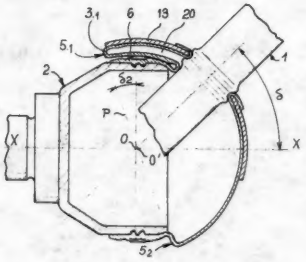
the drive means including periodically engaging gear segments mounted on each section with a motor mounted on one of the sections driving one of the gear segments.

4,597,745

ELASTIC PROTECTIVE BELLOWS FOR A HOMOKINETIC TRANSMISSION JOINT

Michel A. Orian, Conflans Sainte Honorine, France, assignor to Glaenzer Spicer, Poissy, France

Filed Nov. 2, 1984, Ser. No. 668,555
Claims priority, application France, Nov. 8, 1983, 83 17736
Int. Cl.[4] F16D 3/84; F16J 15/00
U.S. Cl. 464—173 15 Claims



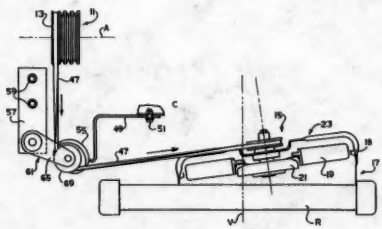
1. An elastic or flexible protective bellows of a homokinetic transmission joint, said joint having a bowl element and a shaft for a motor vehicle wheel, said bellows being adapted to be connected in a sealed manner to said bowl element and to said shaft and comprising, when mounted on the joint, an active part constituted by two coaxial substantially spherical segments, one of which segments is outside the other, the segments being interconnected by a curved movable trough having a vault so as to present a substantially U-shape with said trough, the active part being capable of extending by lengthening of the segments on one side and shortening of the segments on an opposite side, when said bowl element and said shaft turn at a given angle about a centre of rotation, said two spherical segments being the result of a moulding in a single spherical segment comprising two parts in the extension of each other, one of said parts being turned back toward the interior of the bellows when assembling the bellows and the joint so as to form the two spherical segments interconnected by the U-shaped trough resulting from said turning back, so that a plane tangent to the vault of the trough is maintained substantially at said centre of rotation when said bowl element and said shaft are put at an angle to each other.

4,597,746

FAN DRIVE SYSTEM FOR TRANSVERSE ENGINE

Edward J. Goscenski, Jr., Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 5, 1982, Ser. No. 405,621
Int. Cl.[3] F16H 7/00
U.S. Cl. 474—62 6 Claims



1. A system for driving a radiator cooling fan of a vehicle of the type including a vehicle frame and an engine defining an axis of rotation, mounted transversely of the vehicle axis, said engine being capable of substantial movement about said axis of rotation, said system comprising:

(a) a main drive pulley driven by the vehicle engine and rotating in a plane generally parallel to the vehicle axis;

(b) a fan drive assembly having the cooling fan operably associated therewith, said fan drive assembly defining an axis of rotation and being fixedly mounted relative to the vehicle frame and including a driven pulley rotating in a plane generally transverse to the vehicle axis;

(c) an endless power transmission belt in driving engagement with said driven pulley and in driven engagement with said main drive pulley, said belt including a drive portion and a slack portion;

(d) idler pulley means having its axis fixedly mounted relative to one of the vehicle frame and the engine, said idler pulley means being disposed forwardly of said main drive pulley and transversely from said fan drive assembly, said idler pulley means engaging said drive portion of said belt whereby said drive portion defines approximately a right angle; and

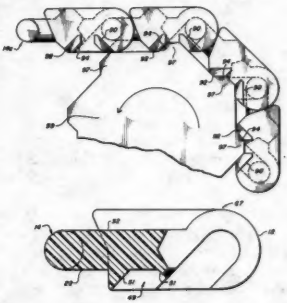
(e) a belt tensioning device including a base portion fixedly mounted relative to one of the vehicle frame and the engine, said tensioning device including a tensioning pulley disposed forwardly of said main drive pulley and transversely from said fan drive assembly, said tensioning pulley engaging said slack portion of said belt whereby said slack portion defines approximately a right angle.

4,597,747

DETACHABLE LINK CHAIN

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Continuation-in-part of Ser. No. 210,861, Nov. 26, 1980, Pat. No. 4,473,365. This application Aug. 9, 1984, Ser. No. 639,308
Int. Cl.[4] F16G 13/07
U.S. Cl. 474—227 6 Claims



1. A multiple link chain composed of a plurality of identical links, each comprising:

a link body having a length and a width, said link body having a solid central portion extending across the entire width thereof and joining respective solid side portions thereof by which the solid central portion is bounded, and having an arm outwardly extending from the solid central portion along the longitudinal axis of the link body beyond the confronting ends of the solid side portions;

one end of said link body having a post on the free end of said arm and disposed along a first pivot axis orthogonal to the longitudinal axis of the link body and having oppositely extending first and second cylindrical post ends;

the other end of said link body having first and second elongated arcuate hook portions laterally extending inwardly from corresponding ones of said solid side portions, said first and second arcuate hook portions each having first and second surfaces that are cooperative to

define first and second arcuate, partially open slots respectively adapted to receive said first and second cylindrical post ends, said first surfaces of each of said arcuate hook portions being integrally formed both with a portion of said solid central portion of said link body and with respective ones of said solid side portions of said link body, said second surfaces of each of said arcuate hook portions being integrally formed with respective ones of said solid side portions of said link body, the arcuate hook portions being disposed along a second pivot axis orthogonal to the longitudinal axis and parallel to the first pivot axis;

a wall on said link body intermediate said first and said second axes defining a recess adapted for receiving a tooth of a sprocket wheel; and

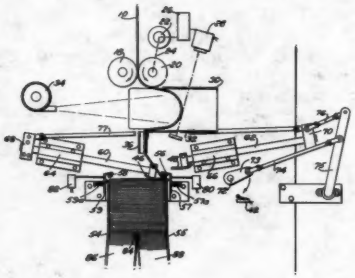
the arcuate hook portions of a link body being pivotally attachable to the post ends of an adjacent link, the pivotally engaged links having a first pivot axis of one link substantially coincident with the second pivot axis of the adjacent link.

4,597,748

METHOD AND APPARATUS FOR FORMING GAUZE PADS

Robert A. Wolf, Colvintown Rd., Coventry, R.I. 02816

Filed Oct. 4, 1984, Ser. No. 657,804
Int. Cl.[4] B65H *45/09, 45/105*
U.S. Cl. 493—29 **2 Claims**



1. A method of folding gauze pads or the like comprising doubling a web of material by delivering a horizontal web into a vertical folding station moving continuously in a horizontal plane in a vertical attitude said web of material from said folding station into vertical feed rolls, driving the rolls, accumulating a length of the web material, maintaining an accumulated length of web material by directing air against the web, varying the speed of the feed rolls responsive to the accumulated length of web directing the web material into a vertically oriented U-shaped guide, moving the web under an impaling means and into a receiving tray by moving a plate onto the web, withdrawing the plate and simultaneously moving a second plate from the opposite side of the web onto the web under a second impaling means.

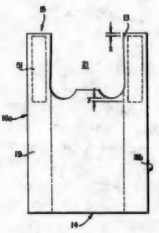
2. A machine for the continuous manufacture of gauze pads comprising means introducing a web into a work path in a horizontal plane, a vertically oriented folding bar means along said path to fold the web in half into a vertical attitude, vertically oriented guide means along said path to maintain the folded web in the vertical attitude, a drive motor, means comprising vertical nip rolls, along said work path and coupled to said drive motor to receive the folded web, a pair of parallel plates vertically oriented, laterally displaced, and transverse to the web in the path, a blower means located away from said plates and on the opposite side of the web in the path for blowing the web in between the plates, control means for determining nip roll speed said control means including sensing means along said path for sensing the depth of the web between the plates, and means for folding the web in accordion fashion, said folding means comprising a pair of folding plates along said path, means mechanically coupling said plates together for imparting alternating motion thereto whereby first one plate is moved into the web and as it withdraws the second plate is moved into the web and, an open ended receiving trough means associated with said plates for receiving the vertical folded web including impaling means located at each leading edge of said trough to grip the edges of the web at its folds.

4,597,749

THERMOPLASTIC BAG HAVING REINFORCED HANDLES AND METHOD OF MANUFACTURE

Dennis O'Brien, Rochester, and Graham Smith, Walworth, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 571,177, Jan. 16, 1984, abandoned. This application Jun. 25, 1985, Ser. No. 748,699
Int. Cl.[4] B31B *1/86*
U.S. Cl. 493—226 **12 Claims**



1. A method of forming a thermoplastic bag structure comprising the steps of:

advancing a flattened tubular plastic film having inwardly directed gussets on opposite side edges thereof to an unfolding station;

unfolding at said unfolding station a flap of sid flattened tubular plastic film for each of said gussets, said unfolded flaps being on the same side of said flattened tubular plastic film;

advancing said unfolded flattened tubular plastic film to a reinforcement strip application station and applying thereat reinforcing strips to flaps forming said gussets, said reinforcing strips being applied to areas of said plastic film which are to form handles of a completed bag;

refolding the flaps of said gussets;

severing said plastic film into segments;

heat sealing top and bottom edges of said segments; and

cutting a mouth opening in a top portion of each said segment to form a bag having front and rear bag walls and handles on opposite sides of said mouth opening which are extensions of said front and rear walls and reinforced by said reinforcing strips.

4,597,750

INSERTION OF DRAW TAPE STRIPS IN DRAW TAPE BAG MANUFACTURE

Dana M. Boyd, Rushville; Vernon C. Catchman, Palmyra, and Kevin Broderick, Victor, all of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

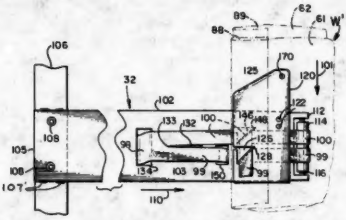
Filed Sep. 20, 1984, Ser. No. 652,252
Int. Cl.[4] B05B *1/14*
U.S. Cl. 493—346 **14 Claims**

1. An apparatus adapted for inserting a flat continuous strip of plastifilm or other pliable material into a hem formed along an edge of a continuous web comprising:

feed means for uninterruptedly feeding in a longitudinal direction a continuous web formed by two superposed, continuous panels, at least one of the panels having one

longitudinal edge portion thereof folded inwardly between the panels and against a facing, intermediate portion of the one panel forming an inwardly turned hem along one longitudinal side of the web, the hem having a fold seam forming a longitudinal side edge of the one panel;

a strip guide arm fixedly positioned downstream from the feed means and extending transversely to the longitudinal direction of the fed web from an initial position outside the web near the one longitudinal side of the web to an extreme position between the panels and beyond the inwardly turned edge portion of the web and having a first planar side substantially parallel to the plane of the web for guiding a first flat continuous strip of pliable material from said initial position to said extreme position and an opposing planar side substantially parallel to the plane of the web for guiding said strip back from said extreme position toward said initial position;



reversing means near said extreme position of the arm for reversing the direction of a flat continuous pliable strip from said first side of the arm to said opposing side of the arm;

first hem separating means mounted to said arm adjoining said opposing side of the arm and extending from a position near said extreme position of the arm to a position between the folded edge portion and the facing intermediate portion of one panel of the web for separating said panel portions from one another as they pass by the arm;

first turning means on said first hem separating means for receiving the strip extending along said opposing side of the arm and for folding the strip from said transverse direction, substantially parallel to the arm, to said longitudinal direction, substantially parallel to the length of the web, while feeding the strip out into the hem; and

take up means downstream from the web feed means and the arm for continuously drawing said web and said strip from said arm.

4,597,751

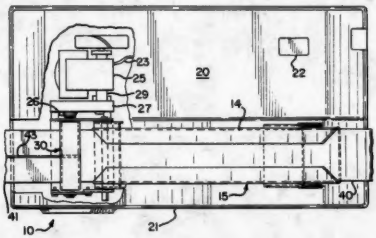
METHOD AND APPARATUS FOR BINDING PAPER

Allen H. Rank, Jr., 270 N. Eisenhower La., Lombard, Ill. 60148

Filed Sep. 10, 1984, Ser. No. 648,746

Int. Cl.[4] B31B *21/26, 29/02;* B65H *45/22*

U.S. Cl. 493—403 **5 Claims**



1. A lightweight portable desktop apparatus for use in scoring elongated paper of limited width, said paper being suitable for binding paper sheaves, said apparatus comprising;

a frame sized for supporting said apparatus on a business desk;

a modular housing mounted on said frame and substantially enclosing said apparatus;

a first roller and a second roller,

said first roller and said second roller being mounted on first and second axles respectively, each of said axles being supported by a pair of roller supports mounted on said frame;

said second axle being mounted for easy removal and replacement of said second roller;

said first roller having a generally flat surface, said second roller having at least one circumferential projection about its midsection, said first roller being of a resilient material, said second roller being of a rigid material;

said second roller being selected from rollers having different numbers of circumferential projections and spacing between projections so as to allow the use of different thicknesses of paper and different scoring formats;

said first roller being operatively connected through a gear box to a fractional horsepower motor for rotational movement therewith, said gear box lowering the rotational output of said motor to a selected speed;

said second roller being adjacent said first roller and in physical contact therewith so as to be driven in following rotational movement by said first roller but in an opposite direction; and

guide means comprising an elongated chute oriented towards said rollers having inwardly extending upper side flanges for retention of said elongated paper within said chute so as to orient and feed said elongated strip of paper to said rollers, where the rotational movement of said rollers causes engagement with said oriented paper, and the scoring and subsequent movement of said paper away from said rollers, said elongated chute being removable and replaceable with elongated chutes of different widths for use with elongated paper of different widths,

said guide means and said frame all being in modular form and of a size as will permit placement on said business desk.

4,597,752

PAPER STACKER FOR A PRE-FOLDED CONTINUOUS WEB WITH A VARIABLE-LENGTH GUIDE CHANNEL

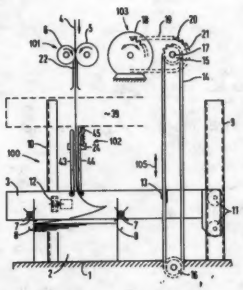
Gerhard Müller, Taufkirchen; Hans Hahn, Unterhaching, and Walter Tropschuh, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 6, 1984, Ser. No. 678,816

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1983, 3346841

Int. Cl.[4] B31B *1/00*

U.S. Cl. 493—410 **7 Claims**



1. In a paper stacker for receiving an endless paper web

having prearranged longitudinal spaced lateral crease lines from a feed means of a device and laying the paper web down in a folded fashion at said crease lines to form a vertical paper stack on a stationary surface positioned below the feed means, said stacker including a frame, piler means located in said frame for depositing the paper web in a folded fashion in the stack on said stationary surface being movable in said frame from a lower position adjacent the stationary surface and an upper position, guide means attached to the piler means for receiving the paper web from the feed means and guiding the paper web to the piler means and lifting means connected to said piler means including a drive motor for elevating the piler means from the lower position toward the upper position as the height of the stack increases, said guide means including a guide channel having a changeable length in response to movement of the piler means relative to the stationary surface, the improvements comprising the guide means being a pair of guide lattices facing each other to provide the guide channel with each of the guide lattices having individual guide members being positioned side-by-side and extending in the direction of movement of the paper web, each of said guide lattices having an upper portion and a lower portion telescopically displaceable inside one another, means for displaceably mounting the upper portion of each guide lattice on guide rods attached to the feed means to enable the upper portion to move relatively to the feed means and the lower portion being connected to the piler means to move therewith.

4,597,753

IMPLANTING METHOD AND DEVICE

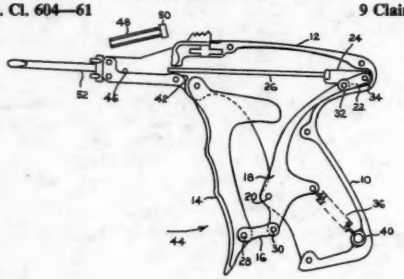
Roger W. Turley, Haverhill, England, assignor to Hundon Forge Limited, Haverhill, England

Filed Apr. 18, 1984, Ser. No. 601,998

Claims priority, application United Kingdom, Apr. 21, 1983, 8310902; Aug. 4, 1983, 8320993

Int. Cl.[4] A61M *5/18*

U.S. Cl. 604—61 **9 Claims**



1. A pellet implanter for the injection of animals, comprising:

a body member,

a hollow needle extending from one end of the body member,

a pin slidably received in the needle and forwardly movable through the needle to urge pelleted material through said needle and into the animal;

an operating mechanism for driving the pin, the mechanism carried by the body member,

abutment means movably mounted on the body member and located outside and adjacent to the needle, said abutment means being movable relative to the shank of the needle in the longitudinal direction thereof and normally being positioned remote from the needle tip; and

means establishing a coupling between the abutment means and the pin for moving the abutment means relative to the needle shank towards the needle tip in response to at least part of the forward movement of the pin.

4,597,754

LONG CAPILLARY TUBE HOSE ASSEMBLY FOR FLUID DISPENSING DEVICE

Gary A. Thill, Vadnais Heights, Minn., and Jerome E. Strand, St. Joseph, Wis., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation-in-part of Ser. No. 317,257, Nov. 2, 1981, Pat. No. 4,430,079, and a continuation-in-part of Ser. No. 144,614, Apr. 28, 1980, Pat. No. 4,298,000, which is a division of Ser. No. 958,678, Nov. 8, 1978, Pat. No. 4,202,333. This application Feb. 7, 1984, Ser. No. 577,757

The portion of the term of this patent subsequent to May 13, 1997, has been disclaimed.

Int. Cl.[4] A61M *37/00, 1/00, 5/14, 5/20*

U.S. Cl. 604—154 **7 Claims**

1. A fluid dispensing device adapted for engaging a fluid-filled syringe to dispense fluid from the syringe at a slow, steady rate of less than 60 cubic centimeters per hour, said syringe being of the type comprising an elongate housing including a tubular wall having an open end and an end wall having an outlet opening at the end of the tubular wall opposite its open end, and a plunger having one end portion positioned within and sealing against the inner surface of said tubular wall and an opposite end portion projecting from the open end of said tubular wall, with the fluid being within said tubular wall between said end wall and said plunger, said device comprising:

a hose assembly having first and second ends and comprising a capillary tube defining a passageway between said ends, said capillary tube having a volume of less than about 0.25 cubic centimeter and a length of at least about 45 centimeters, and said hose assembly further including a coupler at said first end adapted for releasably attaching said for the capillary tubing to the housing of a said syringe with the outlet opening of the syringe communicating with said passageway;

a frame comprising support means adapted for engaging and supporting said coupler;

spring means adapted for applying a uniform force against the plunger of the syringe to cause fluid within said syringe to flow through said hose assembly; and

activating means for moving said spring means between a disengaged position spaced from the plunger of a said syringe attached to said coupler to afford insertion or removal of the syringe and said hose assembly, and an engaged position engaged with said plunger to apply said uniform force, said activating means including securing means for securing the syringe and the coupler of said hose assembly in said support means when said activating means positions said spring means in said engaged position.

4,597,755

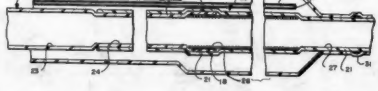
LARGE BORE CATHETER HAVING FLEXIBLE TIP CONSTRUCTION

Wilfred J. Samson, Saratoga, and Deepak R. Gandhi, San Jose, both of Calif., assignors to Advanced Cardiovascular Systems, Inc., Mountain View, Calif.

Filed May 30, 1984, Ser. No. 615,140

Int. Cl.[4] A61M *25/00*

U.S. Cl. 604—96 **7 Claims**



1. In a large bore catheter tube having a flexible tip construction, a main flexible shaft tube having proximal and distal ends and having a flow passage extending therethrough, a coil

spring secured to the distal end of the main shaft tube, and flexible tubing extending over the exterior of the coil spring and having a distal extremity which extends beyond the distal extremity of the coil spring, the flexible tubing forming a close fit over the coil spring, the flexible tubing in conjunction with the coil spring providing an additional passage which adjoins and is in communication with the first named flow passage.

4,597,756

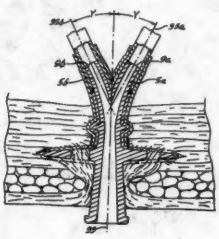
ANGULAR IMPLANT DEVICE

Donald A. Raible, Irvine, Calif., assignor to American Hospital Supply Corp, Evanston, Ill.

Division of Ser. No. 624,801, Jun. 26, 1984, Pat. No. 4,534,760, which is a continuation of Ser. No. 292,844, Aug. 14, 1981, abandoned. This application Apr. 19, 1985, Ser. No. 725,313

Int. Cl.⁴ A61M *5/32, 25/00, 5/00*

U.S. Cl. 604—175 **1 Claim**



1. A urterostomy device comprising:

a passageway having an anchor means, both of which are formed from a material selected from the group consisting of (1) pyrolytic carbon disposed on a graphite substrate and (2) vitreous carbon, for attachment to an opened vessel;

said anchor means for establishing a biological anchor; and

said passageway being further defined as having two substantially rigid inlet sections, each such inlet being initiated with a passageway outlet and having an outlet section terminated with a passageway outlet, said outlet section being in communication with said inlet section, wherein the axial centerline passing through the center of each passageway inlet is inclined with respect to the axial centerline passing through the center of said passageway outlet from between about 45 degrees and about 75 degrees.

4,597,757

HEAT AND SALVE APPLICATOR

Max J. Ruderian, 545 Hanley Ave., W. Los Angeles, Calif. 90049

Filed Jul. 22, 1985, Ser. No. 757,381

Int. Cl.⁴ A61M *7/00*

U.S. Cl. 604—291 **5 Claims**

1. A heat and salve applicator comprising:

a hollow approximately cylindrical applicator body to be held with its axis extending somewhat in a vertical direction,

said body having an upper air intake opening and a lower air exhaust opening;

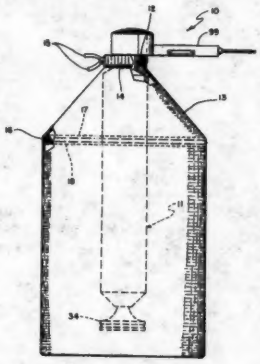
heating means in said applicator body;

a fan mounted within said applicator body above said heating means to establish a flow of air into said upper intake opening, through said heating means and out of said lower exhaust openings;

a hood comprising an approximately cylindrical piece of cloth; and

means sealing said hood around the exterior of said appliator body below but adjacent to said upper intake opening, said sealing means including a foam rubber ring around said applicator body,

a drawstring at the top of said cloth to hold said hood in engagement with said applicator body, and



a rigid ring substantially larger than the diameter of said applicator body sewn into said cloth in a position spaced from said drawstring to cause said cloth to spread out over said applicator and a body portion to be treated.

4,597,758

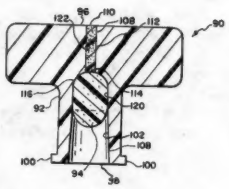
SEALING CLOSURE FOR A LUER FITTING IN OPEN COMMUNICATION WITH A PRESSURIZED LIQUID SUPPLY

William R. Aalto, Spring Grove, and Rick R. Ruschke, McHenry, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Sep. 21, 1982, Ser. No. 420,981

Int. Cl.⁴ A61M *5/005*

U.S. Cl. 604—256 **13 Claims**



1. A removable sealing closure for a male Luer fitting that is in open communication with a pressurized liquid supply, the male Luer fitting being of the type including a locking ring, the sealing closure comprising:

(a) a rigid, hollow cap including

(i) a first end,

(ii) an open second end opposite said first end,

(iii) flange means extending radially outwardly from said hollow cap, near said second end, for engagement by the locking ring and

(iv) a tapered inner surface forming at least a tapered portion of a cavity wall in said hollow cap, said tapered inner surface tapering inwardly from said open second end at the beginning of a cavity defined by said cavity wall, for interfitment with a male Luer fitting;

(b) an elastomeric insert compressively retained by said hollow cap in said cavity, short of the end of said cavity such that at least an end portion of said cavity remains on the first-end side of said elastomeric insert; and

(c) an elastomeric adhesive in said cavity end portion between said elastomeric insert and said cavity wall;

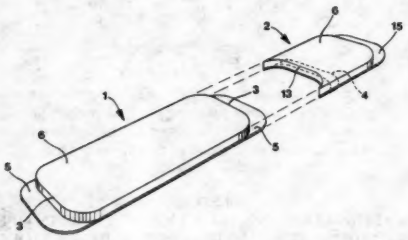
(d) such that said removable sealing closure is adapted to create a liquid-tight seal between said elastomeric insert and an outlet of the male Luer fitting and wherein said elastomeric insert is partially displaced into the outlet of the male Luer fitting upon mating contact of the Luer fitting and said tapered inner surface and securement of the locking ring to said flange means.

4,597,759

EXTENDABLE HYGIENIC PAD

Russell L. Johnson, Waupaca County, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 21, 1983, Ser. No. 544,174
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385 **5 Claims**



1. A sanitary napkin comprising:

a primary pad containing fluid absorptive material, said primary pad having a top, a bottom, sides, a vertical thickness, a lateral width and a longitudinal length;

a second pad containing fluid absorptive material; and

means for engaging said second pad to said primary pad to thereby extend said primary pad along said width and length, this extension being maintained in use of the sanitary napkin wherein said primary pad further includes a fluid impervious baffle along said bottom, a portion of said baffle extending beyond a side of said primary pad along said longitudinal length, said second pad having a mating portion adapted to be received on said extended baffle portion, and adhesive means on said mating portion for fixing said mating portion to said extended baffle portion.

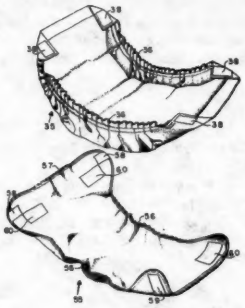
4,597,760

WASTE-CONTAINMENT GARMENT HAVING DISPOSABLE ELASTICIZED INSERT

Kenneth B. Buell, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 27, 1983, Ser. No. 508,453
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—397 **1 Claim**

1. A waste-containment garment comprising an over-garment, an insert having elasticized leg cuffs and a liquid impervious backsheet, and means for securing said insert inside said over-garment so that said leg cuffs of said insert are sealingly tensioned in juxtaposition with skin areas of the wearer when said over-garment having a said insert secured therewithin is applied to a wearer, said means for securing being incorporated in said insert, and said means for securing comprising adhesive means disposed on the outwardly facing corners of said insert and wherein landing-pad members are secured in spaced relation to the inwardly facing surface of said over-garment, said spaced relation being substantially equal to the



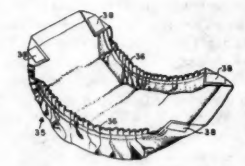
spaced relation of said adhesive means on said insert when said insert is in a non-contracted state.

4,597,761

DISPOSABLE ELASTICIZED WASTE-CONTAINMENT INSERT

Kenneth B. Buell, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 27, 1983, Ser. No. 508,452
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—397 **2 Claims**



1. An integral disposable waste-containment insert comprising an absorbent core, a liquid pervious topsheet, a liquid impervious backsheet, elasticized longitudinally extending leg cuffs disposed adjacent longitudinally extending side edges of said core, means disposed on only the corners of said insert for removably securing said insert in an integral over-garment adjacent its inwardly facing surface prior to applying said over-garment to a wearer, and a reinforcing grommet secured to each outwardly facing corner which grommets are configured and adapted to enable said insert to be secured adjacent the inwardly facing surface of said over-garment by snap fasteners integrated into said over-garment, said grommets further having adhesive areas disposed on their outwardly facing surfaces which adhesive areas are sufficiently adhesive to enable said corners to be attached to inwardly facing surface areas of said over-garment to precipitate sufficient stretching of said elasticized leg cuffs upon applying said over-garment to a wearer that said elasticized cuffs are sealingly engaged with skin surfaces of said wearer and to enable independent positioning of said leg cuffs with respect to said over-garment.

4,597,762
COLLAGEN PREPARATION

Peter Walter, Unterpfaffenhofen-Harthaus, and Michael Walter, Munich, both of Fed. Rep. of Germany, assignors to HEYL Chemisch-pharmazeutische Fabrik GmbH & Co KG, Fed. Rep. of Germany

Filed Nov. 10, 1981, Ser. No. 319,882

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1980, 3042860

Int. Cl.⁴ A61F *2/06, 00/00;* C07K *15/20*

U.S. Cl. 623—1 **21 Claims**

1. A collagen preparation comprising collagen-I for human or veterinary therapy obtained by the following consecutive steps:

(a) proteolyzing mammalian collagen-I material in presence of ficin and L-cysteine in an aqueous medium at a pH value of 5.5–6.5 and at a temperature of 30° to 50° C.,

(b) cross-linking the material obtained according to step (a) with at least one aliphatic dialdehyde of 2 to 10 carbon atoms,

(c) reducing the material obtained according to step (b) with a reducing bleaching agent and

(d) finally sterilizing the material, wherein the texture of the collagen-I material is preserved throughout all steps.

16. A method of surgical repair of defective parts of the body of a mammal comprising replacing the defective parts selected from the group consisting of skin, ligaments, tendons, tendon sheaths, hollow organs, blood vessels and mama with a collagen preparation of claim 1.

4,597,763
IMPLANTABLE MOLDED PLASTIC PART

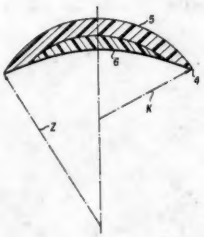
Gertfried Schweikhart, Ober-Olm, Fed. Rep. of Germany, assignor to Rohm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed Mar. 14, 1984, Ser. No. 589,538

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1983, 8308005[U]

Int. Cl.⁴ A61F *1/00*

U.S. Cl. 623—8 **8 Claims**



1. A molded part for use in surgery as a temporary filler for the breast prosthesis, comprising a wet-resistant plastic that is bounded by two curved surfaces and an oval horizontal projection with one of the curved surfaces being a concave approximately cylindrical surface whose curvature is adapted to the human thorax in the breast area and the other surface being an approximately spherical surface whose radius is smaller than the radius of curvature of the cylindrical surface, said molded part consisting of acryl glass, being rigid overall, and having a smooth and non-porous surface.

4,597,764
OSSICULAR REPLACEMENT PROSTHESIS

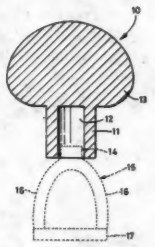
Bruce Black, 73 Wickham Terrace, Brisbane, Australia

Filed Sep. 28, 1984, Ser. No. 655,622

Claims priority, application Australia, Sep. 28, 1983, PG1604; Oct. 7, 1983, PG1734

Int. Cl.⁴ A61F *2/18, 2/28*

U.S. Cl. 623—10 **6 Claims**



1. A replacement ossicular prosthesis comprising a shaft portion adapted for connection with the stapes of the middle ear, and a substantially enlarged head attached to one end of the shaft portion and projecting radially thereof in all directions and having a substantially flat interior surface adjacent to the shaft portion and having an exterior smoothly rounded tympanic membrane engaging surface, said engaging surface having compound curvature on at least two axes of the enlarged head and serving to maintain a large area of contact with the tympanic membrane through a substantial range of tilting of the prosthesis relative to the eardrum.

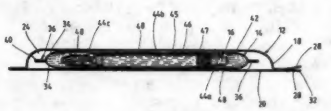
4,597,765
METHOD AND APPARATUS FOR PACKAGING A FLUID CONTAINING PROSTHESIS

William M. Klatt, St. Louis Park, Minn., assignor to American Medical Systems, Inc., Minnetonka, Mich.

Filed Dec. 27, 1984, Ser. No. 686,644

Int. Cl.⁴ A61F *2/02*

U.S. Cl. 623—11 **24 Claims**



1. A packaged fluid containing prosthesis adapted to be implanted in a sterile condition, said prosthesis comprising:

a prosthetic device having a closed, permeable housing defining a fluid containing chamber;

a sealed, substantially fluid impenetrable enclosure surounding said housing and defining a liquid retaining space between said enclosure and said housing, said enclosure adapted for separation from said device prior to implantation of said device; and

said enclosure containing a liquid in said space with activities that substantially match the activities of the fluid in said chamber such that the mass transfer gradient acoss the permeable housing is insubstantial.

14. A method of packaging a fluid containing prosthesis adapted to be implanted in a sterile condition, said method comprising the steps of:

filling a closable permeable housing within a prosthetic device with a fluid;

enclosing said prosthetic device within an enclosure which contains a liquid with activities that substantially match the activities of the fluid within the housing, thereby

rendering insubstantial the mass transfer gradient across the permeable housing; and

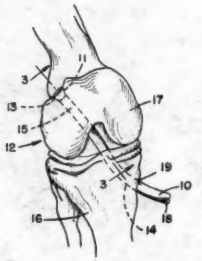
sealing said enclosure about said prosthetic device to define a sealed substantially fluid impenetrable barrier to fluid migration.

4,597,766

IMPLANTABLE BIOPROSTHETIC TENDONS AND LIGAMENTS

Said S. Hilal, Laguna Niguel, and Aws Nashef, Costa Mesa, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Oct. 26, 1984, Ser. No. 665,546
Int. Cl.[4] A61F *1/24*
U.S. Cl. 623—13 **6 Claims**



1. A tendon or ligament bioprosthesis comprised of a naturally occurring tendon or ligament isolated from an animal source, tanned with a bifunctional reagent capable of cross-linking biological tissue, at least one end of the tendon or ligament having attached thereto an intact pliable decalcified chip of the bone from which the tendon or ligament was isolated wherein said bioprosthesis is threaded through a channel of resected bone and said chip being shaped to be received and retained in a recessed opening of said bone thereby affixing said bioprosthesis within said channel.

4,597,767

SPLIT LEAFLET HEART VALVE

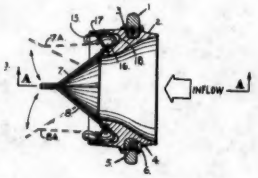
Andrew Lenkei, 79 Mapleleaf Dr., Williamsville, N.Y. 14221

Filed Dec. 15, 1982, Ser. No. 438,571
Int. Cl.[4] A61F *2/24*; F16K *15/00*
U.S. Cl. 623—2 **5 Claims**

1. In a heart valve comprising a hollow annular valve body supporting a plurality of interfitting conically shaped identical leaflet portions each having equiangular arcs to form at least a two cusp valve which is seated for opening and closing movement at the base of each of said leaflet portions where said valve body supports leaflet portions, that improvement comprising:

a valve seating means formed as a recessed circumferential groove of V section in said valve body at the upper edge thereof which constitutes the sole seating groove within which each leaflet is mounted for pivotal opening and closing movement;

the V section of said groove being formed with one divergent inner surface along which a divergent conical base portion of each leaflet conforms, being formed with a rounded bottom portion at the bottom apex and being formed with a straight distal inner wall portion adapted to retain retaining, pivoting and leaflet spring means which also lie wholly within the groove;



each of said leaflet portions being provided with at least one oversized opening at the base to accommodate a pin and further being formed as a hook at the bottom edge to conform to the curved bottom of the groove;

a pin in each opening held at its ends between the inner divergent wall and the inner distal straight wall to serve as a pivot for the opening and closing movement of each of the leaflets with respect to the adjacent leaflet;

each of said leaflet portions composed of foil selected from the class consisting of stainless steel, pyrolytic carbon and titanium;

each of said leaflet portions having projecting rectangular lip portions which interfit against adjacent leaflet portions to lie flat against each other; and

a plurality of leaf spring means lying wholly within said groove nesting against the hook edge of said leaflet portions on opposite sides of said pin and oversized openings and retained by the straight distal wall of said groove.

4,597,768

METHOD FOR TREATMENT IN COUNTER CURRENT OF SUSPENDED PARTICLES WITH A LIQUID

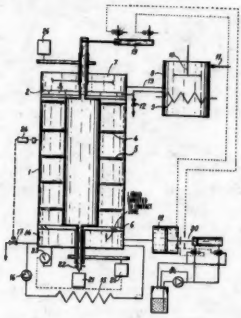
Henricus A. C. Thijssen, Son (N.B.), and Gerardus J. Arkenbout, Zeist, both of Netherlands, assignors to Nederlandse Centrale Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek, The Hague, Netherlands

Filed Jun. 21, 1983, Ser. No. 506,330

Claims priority, application Netherlands, Jun. 22, 1982, 8202518

Int. Cl.[4] B01D *9/04*

U.S. Cl. 23—299 5 Claims



1. In a method for concentrating a suspension containing solid particles comprising the steps of:

moving said suspension through a contact zone having a central axis bounded by a wall;

moving a liquid through said zone countercurrent to said suspension, thus moving said liquid in the opposite direction of said suspension;

stirring said suspension in said contact zone, in regions which extend across an entire cross section of said contact zone and perpendicular to said axis, said regions being positioned at a plurality of locations spaced in the axial direction;

removing separated particles from said contact zone;

whereby a concentrated suspension is provided comprising providing the entire length of said contact zone with a substantially uniform cross-section along said axis and with an open space devoid of stationary baffle means that limit free mixing and circulation throughout said contact zone and the step of maintaining the volume fraction of the particles in the concentrated suspension in the contact zone at a value between 0.20 and 0.55 throughout the contact zone so that said suspension remains in a pseudoplastic state.

4,597,769

COAL DEMINERALIZATION AND DEPYRITIZATION PROCESS

Amir Attar, 7817 Haymarket La., Raleigh, N.C. 27609

Filed Mar. 11, 1985, Ser. No. 710,220

Int. Cl.[4] C10L *9/02*

U.S. Cl. 44—1 SR 11 Claims

1. A coal dimineralization process comprising the steps of: reducing the polar nature of the coal surface and reducing the surface forces between organic and inorganic phases of the coal by chemically treating the surface of the coal in a gas phase by reacting and neutralizing polar alcoholic and carboxylic groups; the step of chemically treating the surface of coal including subjecting the surface of the coal to a gaseous alcohol composition for a selected period of time at a temperature range of 100 degrees to 250 degrees C. and adding to the gaseous alcohol composition and the coal being treated by an acidic gas which acts as a catalyst for the resulting chemical reaction all of which results in a neutralization effect on the polar groups and reduces the forces about the surface of the coal that attract and hold the mineral particles; and after chemically treating the surface of the coal to reduce the forces attracting and holding the mineral particles to the coal, then separating the mineral particles from the coal so as to reduce the mineral content of the coal.

4,597,770

COAL-WATER SLURRY COMPOSITIONS

Joseph T. Forand, Fairfield, and James A. Hellyer, Milford, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 24, 1984, Ser. No. 686,115

Int. Cl.[4] C10L *1/32*

U.S. Cl. 44—51 11 Claims

1. Coal-water slurry compositions comprising:

(a) from about 50% to about 85% of finely divided coal particles having a particle size such that substantially none of said particles has a size greater than 4 Tyler mesh;

(b) from about 0.01% to about 5.0% of sulfated O-glycosides having the formula

$$RO(R'O)_t—(Z)_x—(SO_4M)_n$$

wherein R is selected from the group consisting of substituted and unsubstituted aliphatic and aromatic hydrocarbons having from 6 to about 32 carbon atoms, wherein the substituents are nonionic groups consisting of carbon, hydrogen, oxygen and combinations thereof, R′ is selected from substituted and unsubstituted alkyl groups having from 2 to 4 carbon atoms, wherein the substituent is hydroxy, t is a single number or distribution of numbers from 0 to about 30, Z is the residue of a reducing monosaccharide, x is a single number or distribution of numbers from 1 to about 10, n is a single number or distribution of numbers from 1 to 3x+1, and M is an inorganic or organic cation; and

(c) from about 10% to about 50% water.

4,597,771

FLUIDIZED BED REACTOR SYSTEM FOR INTEGRATED GASIFICATION

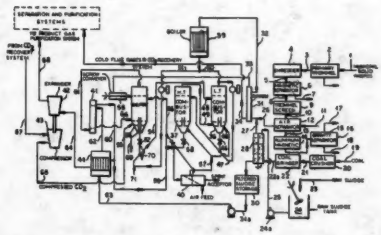
Shang-I Cheng, 17 Woodsend Dr., Matawan, N.J. 07747

Filed Apr. 2, 1984, Ser. No. 595,948

The portion of the term of this patent subsequent to May 15, 2001, has been disclaimed.

Int. Cl.[4] C10J *3/56*

U.S. Cl. 48—77 11 Claims



1. A gasification apparatus which comprises:

a fluid bed gasifier including an upright fluid-bed chamber, means for introducing afluidizing gas into said chamber at a bottom portion thereof, said gasifier having a conical bottom containing a molten aluminum pool and a layer of char above said pool, a pipe extending upwardly through said pool above the surface thereof for the continuous withdrawal of char from said gasifier, means below the

upper end of said pipe for tapping said pool, and three feed ports respectively for introducing CaO, sludge and a combination of comminuted coal and shredded municipal waste for gasifying said comminuted coal, sludge and shredded municipal waste in the presence of hot CaO to produce a char and a product gas, and means for discharging said char and means for discharge said product gas;

a low-temperature fluid bed combustor means connected to said gasifier and receiving said char therefrom and provided with means for feeding a flue gas to the combustor for reacting said char with a flue gas containing air to produce an output gas and a partially burned char;

a high-temperature fluid bed combustor means connected to said low-temperature fluid bed combustor and receiving said partially burned char therefrom for fully burning same to produce said flue gas and a solid product rich in CaO;

a separator connected to said high-temperature fluid-bed combustor receiving said solid product for separating hot CaO from slag and supplying said hot CaO to said gasifier;

separation and purification means receiving said output gas and recovering CO_2 therefrom; and

means for feeding the recovered CO_2 as said fluidizing gas to said gasifier.

4,597,772

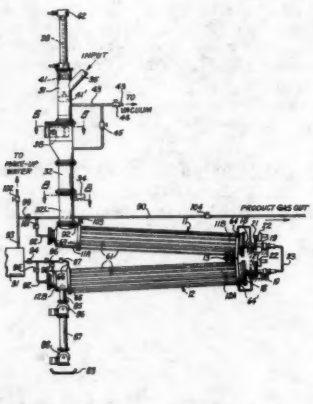
FIXED KILN WITH ROTOR STEAM GASIFIER

John A. Coffman, Ballston Spa, N.Y., assignor to Wright-Malta Corporation, Ballston Spa, N.Y.

Filed Sep. 20, 1984, Ser. No. 652,481

Int. Cl.[4] C10J 3/00

U.S. Cl. 48—111 **34 Claims**



1. A fixed kiln with rotor steam gasifier having a fixed elongated cylindrical, pressurizable kiln body member with an input end and an output end and with the center axis thereof supported at an angle relative to the horizontal so as to bring into effect gravitational forces acting on high moisture content biomass material fed into the input end and traveling to the output end, said fixed kiln with rotor gasifier including an axially extending rotor rotatably supported within the fixed kiln body member and means for rotating said rotor at a predetermined rotational speed, said rotor including radially spaced-apart scoop-like blade elements extending along the axial length of the kiln body member for tumbling the biomass material fed into the rotor kiln as it travels along the axial length of the fixed kiln body member from the input to the output end thereof, means for heating the interior of the fixed kiln body member to a high temperature with a continuously increasing temperature profile along its axial length from the input end to the output end, means for introducing biomass material into the input end of the kiln body member where it is acted upon by the rotor and a high temperature-high pressure steam atmosphere self-induced in the kiln body member, said scoop-like blade elements of the rotor being radially and axially arrayed relative to one another to define axially extending hollows between the radially spaced-apart blades for receiving and tumbling the biomass material fed into the input end of the kiln body member and at least one stirring and agitating chain-like device disposed in at least one of the hollows for further agitating and stirring the biomass material as it travels through the kiln body member to prevent the agglomeration and/or sticking of the material to the sides of the kiln or scoop-like blade elements.

4,597,773

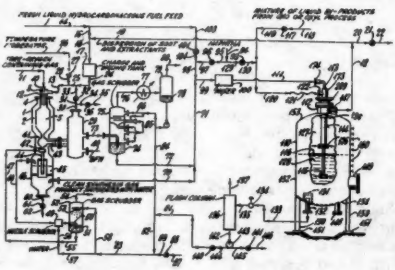
PROCESS FOR PARTIAL OXIDATION OF HYDROCARBONACEOUS FUEL AND RECOVERY OF WATER FROM DISPERSIONS OF SOOT AND WATER

Manuel E. Quintana, Yonkers, N.Y., and Lawrence E. Estabrook, Whittier, Calif., assignors to Texaco Development Corporation, White Plains, N.Y.

Division of Ser. No. 460,411, Jan. 24, 1983, Pat. No. 4,490,251. This application Jul. 30, 1984, Ser. No. 635,871

Int. Cl.[4] C10J 3/46

U.S. Cl. 48—197 R **6 Claims**



1. In a continuous process for producing cool and clean synthesis gas, fuel gas or reducing gas comprising reacting a hydrocarbonaceous fuel with a free-oxygen containing gas in the presence of temperature moderator in a free-flow noncatalytic partial oxidation gas generating zone to produce a hot effluent gas stream comprising H_2, CO, CO_2, soot, and at least one gas from the group H_2O, H_2S, COS, CH_4, N_2 and Ar; quench cooling and scrubbing with water and/or cooling in a gas cooler and scrubbing with water said effluent gas stream to cool said effluent gas stream and to remove at least a portion of said soot, thereby producing a dispersion of soot and water; the improvement comprising: (1) mixing a first liquid organic extractant which is substantially immiscible with water and comprising a light liquid hydrocarbon fuel having an atmospheric boiling point in the range of about 100° F. to 700° F., degrees API in the range of over 20 to about 100, and a carbon number in the range of about 5 to 16 with said soot-water dispersion in the amount of about 1.5 to 15 lbs. of said first liquid organic extractant per lb. of soot so as to render said soot hydrophobic and to release dry-appearing powdered soot from said soot-water dispersion, thereby producing a liquid feed mixture of soot, water and first liquid organic extractant; and separating said liquid feed mixture by gravity into a clarified water layer and a soot dispersion in a closed vertical cylindrical decanter vessel substantially filled with liquid, and wherein said soot dispersion floats on said clarified water layer at the interface level; wherein said liquid feed mixture is continuously introduced into said vessel by way of a vertical conduit which is coaxial with the central vertical axis of said vessel and then through a communicating first horizontal radial nozzle located below the interface level and with said radial nozzle uniformly

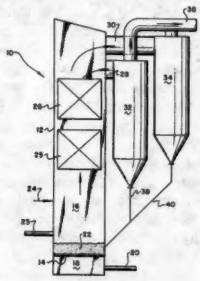
distributing said feed 360°, and wherein the temperature in said vessel is in the range of about 200° F. to 650° F. and the pressure is high enough to keep said liquid organic extractant in liquid phase; while (2) simultaneously and continuously introducing a second separate liquid organic extractant comprising a mixture of liquid organic by-products from an oxo or oxyl process and having the following ultimate analysis in weight %: carbon 55 to 90, hydrogen 5 to 17, and oxygen 3 to 40, into said vessel by way of conduit means which is coaxial with the central vertical axis of said vessel and then through a communicating second horizontal radial nozzle located above said interface level and which uniformly distributes the second extractant 360°; and said second liquid organic extractant is introduced into said vessel to float off the soot from the surface of the bottom water layer while forming dispersion of soot and co-extractants having a soot content in the range of about 0.5–9.0 weight percent; (3) simultaneously and separately removing a continuous stream of said separated water from an outlet in the bottom of said vessel and a continuous stream of said dispersion of soot and co-extractants from an outlet in the top of said vessel; (4) recycling at least a portion of said clarified water, with or without purification, to said gas quench cooling and/or scrubbing operations to cool and/or scrub said effluent gas stream and to produce said dispersion of soot and water; and (5) recycling at least a portion of said dispersion of soot and co-extractants to the partial oxidation gas generating zone as at least a portion of the feedstock.

4,597,774

METHOD FOR IMPROVING THE OPERATION OF A FLUIDIZED BED

Juan A. Garcia-Mallol, Morristown, N.J., and Brian T. Sinn, Williamsport, Pa., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Oct. 22, 1984, Ser. No. 663,533
Int. Cl.⁴ F27B *15/08*
U.S. Cl. 48—197 R **9 Claims**



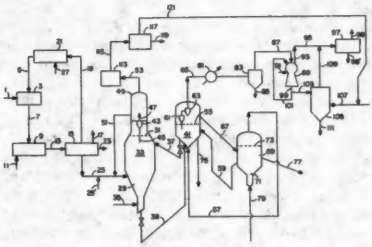
1. A method of operating a fluidized bed combustion reactor comprising the steps of disposing on a perforated plate a bed of particulate material including a sulfur adsorbent material and a combustible material, introducing air through said plate and into said bed to fluidize and promote the combustion of said materials, and providing an exit for combustion gases which would normally entrain a portion of said materials as said gases pass through said bed; wherein the improvement comprises the step of introducing additional particulate material to said bed, said additional particulate material being of a different composition than said sulfur adsorbent material and said combustible material and being of a particulate size less than the particulate size of said sulfur adsorbent material and combustible material so that said additional particulate material is neither sulfur adsorbent or combustible and is entrained in said gases while said sulfur adsorbent material and combustible material ar maintained in said bed.

4,597,775

COKING AND GASIFICATION PROCESS

Rustom M. Billimoria, Houston, and Frank F. Tao, Baytown, both of Tex., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Apr. 20, 1984, Ser. No. 602,309
Int. Cl.⁴ C10J *3/54*
U.S. Cl. 48—197 R **8 Claims**



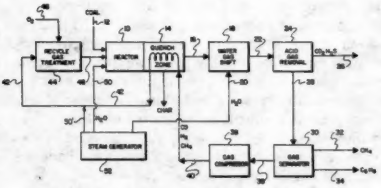
1. In a coking process wherein a normally solid carbonaceous material is coked at a temperature within the range from about 850° F. and at a pressure within the range from about 5 to about 150 psig and the coke fluidized during the coking operation, the improvement wherein gaseous ammonia or a gaseous ammonia precursor is added to the coker in an amount sufficient to provide from about 1 to about 60 wt % gaseous ammonia in the coker based on the weight of carbon in said solid carbonaceous material.

4,597,776

HYDROPYROLYSIS PROCESS

Alan Z. Ullman, Northridge; Jacob Silverman, Woodland Hills, and Joseph Friedman, Huntington Beach, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 432,231, Oct. 1, 1982, abandoned. This application Jan. 22, 1985, Ser. No. 693,319
Int. Cl.⁴ C10J *3/46*
U.S. Cl. 48—197 R **13 Claims**



1. A process for producing methan by reacting a hydrogen-deficient carbonaceous material with a hydrogen-containing pyrolysis gas having a composition selected and controlled so that no external source of hydrogen is needed to provide the hydrogen requirements for the overall process, which comprises the sequential steps of:

(a) introducing said pyrolysis gas at an elevated temperature and pressure and said carbonaceous material into a single pyrolysis zone of an entrained flow reactor (**10**) to react to form a product gas mixture including methane, carbon monoxide and a reduced content of hydrogen relative to that in said pyrolysis gas;

(b) reacting a part of the carbon monoxide in said product gas mixture with a first controlled amount of steam in a water-gas shift reaction zone (**18**) sufficient to produce

hydrogen in an amount substantially equal to the hydrogen consumed in the overall process;

(c) withdrawing from said water-gas shift reaction zone a shifted gas mixture containing additional hydrogen and introducing said shifted gas mixture into a gas separation zone (30);

(d) separating the shifted gas mixture in said gas separation zone into (1) a product comprising methane, and (2) a recycle gas comprising hydrogen, carbon monoxide and methan;

(e) introducing said recycle gas from step (d) (2), a controlled amount of an oxygen-containing gas and a second controlled amount of steam into a gas treatment zone (44) for partial oxidation of the recycle gas to produce said pyrolysis gas having said elevated temperature for introduction into said entrained flow reactor (10); and

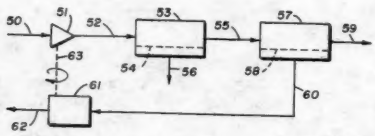
(f) controlling steps (b), (d) and (e) to obtain, under steady-state conditions, a composition of the pyrolysis gas wherein hydrogen is the principal constituent and the remainder consists essentially of a monor amount each of carbon monoxide, steam and methane so that no external source of hydrogen is needed to provide the hydrogen requirements for the overall process.

4,597,777

MEMBRANE GAS SEPARATION PROCESSES

Tommy E. Graham, Raleigh, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed Feb. 15, 1983, Ser. No. 466,686
Int. Cl.[4] B01D *53/22*
U.S. Cl. 55—16 **9 Claims**



1. A membrane gas separator apparatus for recovering a methane-enriched non-permeate gas from a mixture comprising methane and carbon dioxide, said appartaus comprising at least one first separator having a membrane exhibiting selectivity to the permeation of carbon dioxide; at least one subsequent separator having a membrane exhibiting selectivity to the permeation of carbon dioxide; a combustion engine for generating power; means for providing said mixture at a permeating pressure to said at least one first separator; means for conducting a non-permeate gas from said at least one first separator to said at least one subsequent separator; means for withdrawing carbon dioxide-enriched permeate gas from said at least one first separator; means for withdrawing a methane-enriched non-permeate gas from said at least one subsequent separator; means for conducting a combustible permeate gas from said at least one subsequent separator to a fuel inlet of said combustion engine; and means for transmitting power from said combustion engine to said means for providing said mixture at a permeating pressure.

5. A membrane gas separation process for recovering from a mixture comprising from 30 to 70 mole percent methane and from 30 to 60 mole percent carbon dioxide a methane-enriched non-permeate gas said process comprising

(a) passing said mixture to means for providing said mixture at a permeating pressure;

(b) passing said mixture at a permeating pressure to at least one first separator having a membrane exhibiting selectivity to the permeation of carbon dioxide, wherein the separation factor, $\alpha CO_2/CH_4$, is at least about 9;

(c) allowing the non-permeate gas from said at least one first separator to pass at a permeating pressure to at least one subsequent separator having a membrane exhibiting selectivity to the permeation of carbon dioxide, wherein the separation factor, $\alpha CO_2/CH_4$, is at least about 9;

(d) withdrawing a carbon dioxide-enriched permeate gas from said at least one first separator;

(e) withdrawing a methane-enriched non-permeate gas comprising at least about 90 mole percent methane from said at least one subsequent separator; and

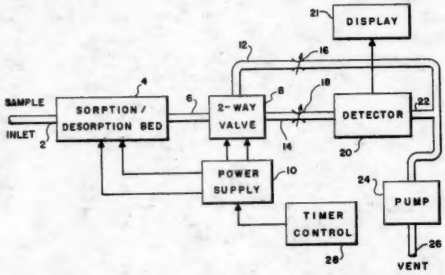
(f) allowing a combustible permeate gas comprising at least about 40 mole percent methane to flow from said at least one subsequent separator to a combustion engine having means to transmit power to said means for providing said mixture at a permeating pressure.

4,597,778

QUASI-CONTINUOUS SORPTION/DESORPTION ANALYSIS METHOD AND AN APPARATUS UTILIZING THE SAME

Eugene L. Szonntagh, Largo, Fla., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 22, 1984, Ser. No. 663,108
Int. Cl.[4] B01D *53/04, 35/18*
U.S. Cl. 55—18 **14 Claims**



1. A method for gas analysis including the steps of applying a sample of a gas to be analyzed across a stationary sorption/-desorption bed to produce a sorption of the gas by the bed during a high rate of flow of the sample of the gas across the bed by directing the sample of the gas through a sealed gas flow system containing the bed and a high flow rate pipeline converting after a predetermined time period the high flow rate of the sample of the gas to a relatively low flow rate of the sample of the gas across the bed by switching the flow of the sample of the gas to a low flow rate pipeline forming a part of the sealed gas flow system and desorbing the sorbed gas from the bed by a rapid heating of the bed during the low flow rate of the sample of the gas across the bed to produce a flow of all of the desorbed gas through the low flow rate pipeline.

6. A gas analysis apparatus comprising

sample inlet means for connection to a source of a gas to be analyzed,

stationary sorption/desorption bed means including a sorption/desorption bed, a housing for said bed, an input for said housing connected to said inlet means to receive the gas to be analyzed and a housing output,

flow control means connected to said housing output and including a low flow rate pipeline and a high flow rate pipeline and a flow switching means for selectively controlling a flow across said sorption/desorption bed of the gas to be analyzed between a high flow rate and a low flow rate by switching the flow of the gas to be analyzed between said high flow rate pipeline and said low flow rate pipeline, said housing, said housing input and output, said low flow rate pipeline, said high flow rate pipeline and said flow switching means forming a sealed gas flow system,

detector means connected to said low flow rate pipeline for analyzing a low flow rate output of the gas to be analyzed from said bed means and all of the gas desorbed from said bed,

heater means for selectively heating said sorption/desorption bed and

control means for selectively energizing said heater means during a low flow rate state of said flow control means to desorb a sorbed gas from said bed and for switching said flow control means to direct said flow of the gas to be analyzed between said high flow rate and said low flow rate.

4,597,779

PROCESS FOR INHIBITING HYDRATES WHILE PRODUCING MOIST CO_2 FROM SUBTERRANEAN RESERVOIRS

Zaida Diaz, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 27, 1985, Ser. No. 706,371
Int. Cl.[4] B01D *53/14*
U.S. Cl. 55—32 7 Claims

1. In a CO_2-producing process in which moist CO_2 is produced at high pressure from a subterranean well, is mixed with a hydrate inhibitor and is piped to a facility for drying CO_2 and subsequently supplying it for use at high pressure, an improvement for avoiding the need for producing and piiping the CO_2 at pressures and temperatures maintaining a single phase state comprising:

conducting said producing and piping of moist CO_2 at pressure and temperature conditions of at least about 500 psia but less than critical conditions and the ambient temperature near the wellhead apt to convert the fluid being piped to a fluid containing both an aqueous liquid-phase and a CO_2-rich liquid-phase having a volume which is many times greater than that of the aqueous liquid-phase;

mixing the so produced moist CO_2 with sufficient hydrate inhibitor to cause the concentration remaining in said aqueous phase to be sufficient to prevent hydrate formation in spite of the amount of inhibitor which will be partitioned into said CO_2-phase; and

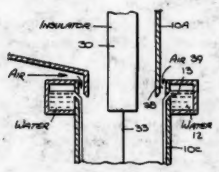
using as said hydrate inhibitor a polyhydric alcohol hydrate inhibitor having a solubility in CO_2 at the conditions in the pipe which is low relative to the solubility of methanol in that CO_2, so that, while simplifying the producing and piping operations, both the contamination of CO_2 and loss of inhibitor are minimized.

4,597,780

ELECTRO-INERTIAL PRECIPITATOR UNIT

Robert B. Reif, Grove City, Ohio, assignor to Santek, Inc., Greensboro, N.C.

Continuation-in-part of Ser. No. 270,675, Jun. 4, 1981, abandoned, which is a continuation of Ser. No. 898,556, Apr. 21, 1978, abandoned. This application Mar. 9, 1982, Ser. No. 356,429
Int. Cl.[4] B03C *3/53, 3/78*
U.S. Cl. 55—119 3 Claims



1. An electro-inertial precipitator unit for extracting dust and other particles from a contaminated gaseous stream, the unit comprising:

A. a vertically-mounted collector tube whose upper end is closed by a cover, said tube having an upper inlet section, a main section and open-ended outlet section;

B. a discharge electrode assembly including a wire extending through said main section having a high voltage applied thereon relative to said collector tube to establish between said wire and said tube an electrostatic field therein which causes ions to be generated at said wire;

C. means including an annular water inlet slot formed at the junction of the inlet and main sections of the tube to feed water therein to form a water film on the inner surface of the tube which flows downwardly into and is discharged from the open end of the outlet section, said water inlet slot having an upper lip whose surface is subject to wetting by a wicking action and the deposition of dust thereon;

D. scavenging means to blow air over the surface of the upper lip of the water inlet slot to prevent wetting of this surface and the deposition of dust thereon; said scavenging means being constituted by a cylindrical apron disposed within said collector tube and coaxially arranged with respect to said upper lip to define an air passage therewith whose lower end is adjacent said water inlet slot, and an annular air inlet slot formed in said collector tube above said water inlet slot and communicating with said air passage to introduce air into said air passage to scavenge the surface of the upper lip, the air discharged from the lower end of the passage being projected therefrom in a path substantially parallel to the water film flowing downwardly below the water inlet slot;

E. means to introduce said contaminated gas stream tangentially into said inlet section; and

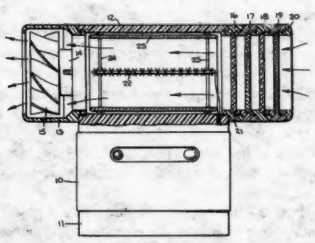
F. means coupled to said outlet section to produce a suction force drawing said steam from the inlet section at high velocity and, in combination with said means to introduce said gas tangentially, imparting a swirling motion thereto to cause said gaseous stream to flow in a helical path down the tube against the liquid film and to induce a swirling pattern therein, the centrifugal force created by the swirling motion urging particles carried by the stream to migrate and to be collected by the film and to be flushed out of the tube, which migration is further promoted by the electrostatic force acting on the particles which are charged by the ions in the field.

4,597,781

COMPACT AIR PURIFIER UNIT

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Filed Nov. 21, 1984, Ser. No. 673,725
Int. Cl.[4] B03C *3/01*
U.S. Cl. 55—126 9 Claims



1. A compact air purifier unit adapted to remove contaminating particles of varying sizes which fall within different classes in a range from fine to coarse from the atmosphere of a room, said unit comprising:

A a flow tube having an inlet and an outlet;

B a suction fan coupled to the outlet of the tube to draw air therethrough; and

C a series of removable filter rings all having the same diameter, each provided with an air-permeable filter element supported within a ring, said filter rings being coupled to each other and to the inlet of the tube, each filter ring having a different grade of filter element therein, each

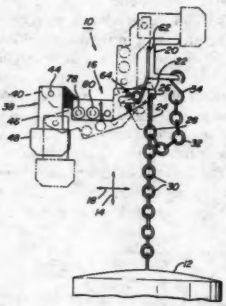
grade being adapted to remove particles in a given class in said range whereby the series acts to remove the fine and coarse particles from the air stream passing therethrough, said rings being provided with intercoupling means whereby the series thereof may be coupled to each other, with the last in the series being coupled to the inlet of the tube.

4,597,782

FILTER BAG TENSIONING SYSTEM AND METHOD

William B. VanHooser, Baltimore, and Robert J. W. Williams, Lutherville, both of Md., assignors to Environmental Elements Corp., Baltimore, Md.

Filed Jan. 25, 1985, Ser. No. 694,966
Int. Cl.[4] B01D *46/00*
U.S. Cl. 55—378 27 Claims



1. A method of attaching and replacing a filter bag in a bag house in which an adjustable tensioning mechanism is pivotally supported intermediate its ends at a desired pivot point by a pivot affixed within the upper reaches of said bag house and said adjustable tensioning mechanism is provided with filter bag support means adjacent one end and a weight and weight securement means adjacent an opposing end including the steps of:

(a) rotating said weight securement end of said adjustable tensioning mechanism to a substantially vertical positional disposition;

(b) moving said bag support end of said adjustable tensioning mechanism in a substantially vertically downward direction;

(c) attaching a filter bag to said filter bag support means;

(d) rotating said weight securement end of said adjustable tensioning mechanism to a generally lateral position relative to said pivot;

(e) displacing said adjustable tensioning mechanism to said pivot point;

(f) adjusting a first tension adjustment member relative to a second tension adjustment member of said adjustable tensioning mechanism to provide a predetermined filter bag tension;

(g) fixedly securing said first tension adjustment member to said second adjustment member; and,

(h) when said filter bag is to be replaced, repeating said above sequence of steps with removal of said existing filter bag and attachment of a new filter bag.

4,597,783

TENSIONING DEVICE FOR BAG FILTERS

James H. Brennecke, Kansas City, and Robert E. Mace, Raytown, both of Mo., assignors to Standard Havens, Inc., Kansas City, Mo.

Continuation-in-part of Ser. No. 630,668, Jul. 13, 1984, abandoned. This application Dec. 20, 1985, Ser. No. 811,453
Int. Cl.[4] B01D *29/14*
U.S. Cl. 55—378 6 Claims

1. In a dust collector having a bag support frame and a cell plate to which is connected one end of a fabric sleeve filter, a self tensioning bag device comprising:

compressible conical spring means interconnected between said bag support frame and the other end of said fabric sleeve filter opposite said one end connected to said cell plate, said spring means having first and second open ends wherein said first end is larger in diameter that said second end and said spring means tapers uniformly from said first end to said second end;

retainer means overlyingly connected to said first end of said conical spring means and having a central opening therethrough, said retainer means providing a first spring biasing surface;

first draw bar means having outwardly extending ears engaging said retainer means and a U-shaped spring penetrating portion received within the central opening of said retainer means and received longitudinally through the length of said spring means to terminate in a bight end outwardly from said second end of said spring means;

bag connecting means coupled to said bight end of said first draw bar and connected to said filter to suspendingly support said filter therefrom;

second draw bar means having outwardly extending ears engaging said second end of said spring means to provide a second spring biasing surface, said second draw bar means including a U-shaped spring penetrating portion received longitudinally through the length of said spring means and received within the central opening of said retainer means to terminate in a bight end outwardly from said retainer means;

adjustable frame support means connected to said bag support frame and to said bight end of said second draw bar means; and

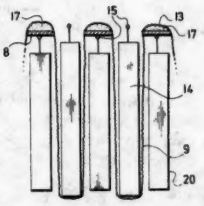
whereby said filter sleeve is suspended from said bag support frame and appropriately tensioned by said adjustable frame support means to permit said spring means to linearly act against said first and second spring biasing surfaces in opposing fashion.

4,597,784

INDUSTRIAL FILTER

Jiri Albrecht, Prague, and Václav Mrstina, Brno, both of Czechoslovakia, assignors to MOTOTRANS narodny podnik, Banska Bystrica, Czechoslovakia

Filed Feb. 1, 1985, Ser. No. 697,328
Int. Cl.[4] B01D *46/00*
U.S. Cl. 55—378 **8 Claims**



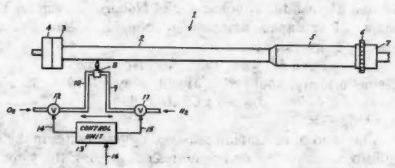
1. Industrial filter for separating solid particles from a streaming gaseous medium, comprising a multipocket filter insert with inlet and outlet sides comprising a single band of a knitted fabric folded into a number of flat pockets, two longitudinal packing sleeves and two transverse packing sleeves as well as connecting parts between single pockets, the resulting multipocket filter insert being provided with a smooth permeable layer of amorphous synthetic polymeric material on the whole surface at least of one of its sides both the longitudinal and the transverse pakcing sleeves of the multipocket filter insert being fixed to marginal surfaces of a partition wall of the filter by means of a pressure sealing frame, the connecting parts of the multipocket filter insert slidingly resting by their smooth permeable layer of amorphous synthetic polymeric material against the horizontal internal surfaces of the partition wall, the flat pockets being inserted on by one in each opening of a partition wall which is provided with internal spacers, between the single flat pockets there being external spacers, both the internal and the external spacers being swingingly suspended or attached to the partition wall by means of suspension elements.

4,597,785

METHOD OF AND APPARATUS FOR MAKING OPTICAL PREFORMS WITH A PREDETERMINED CLADDING/CORE RATIO

Kamran Karbassiyoon; Francis I. Akers; Larry J. Raplee, and Daniel G. Fletcher, all of Roanoke, Va., assignors to ITT Corporation, New York, N.Y.

Filed Aug. 1, 1984, Ser. No. 636,525
Int. Cl.[4] C03B *37/012, 37/07*
U.S. Cl. 65—2 **2 Claims**



1. A method of making optical fiber preforms, comprising the steps of

providing a respective tubular glass body including an outer cladding region and an inner core region of desired optical properties, said respective tubular glass body having an initial ratio of cladding cross-sectional area to core cross-sectional area;

detecting said ratio for the respective tubular glass body;

collapsing the tubular glass body into a respective optical preform having a predetermined cladding to core cross-sectional area, including applying a flame resulting from the combustion of a combustible mixture of a gaseous fuel with an oxidizing gas to the exterior of the respective tubular glass body; and

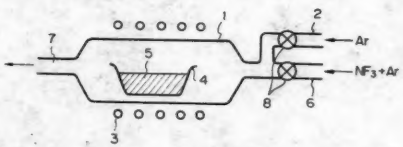
causing the cladding to core cross-sectional area ratio of the optical preform to fall between predetermined limits providing desired optical properties for the optical preform, including varying at least the proportion of the gaseous fuel in the mixture relative to the oxidizing gas during the collapsing step as a function of the detected ratio to provide increased proportion of the fuel in the mixture when the detected initial ratio is above said predetermined limits, with attendant increased evaporation of the material of the outer portion of the cladding region of the respective tubular glass body.

4,597,786

PURIFYING PROCESS OF FLUORIDE GLASS

Tetsuya Nakai, Kanagawa; Yoshinori Mimura, Saitama; Osamu Shinbori, Tokyo, and Hideharu Tokiwa, Saitama, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Aug. 19, 1985, Ser. No. 767,394
Claims priority, application Japan, Sep. 4, 1984, 59-183752
Int. Cl.[4] C03C *3/12*
U.S. Cl. 65—2 **9 Claims**

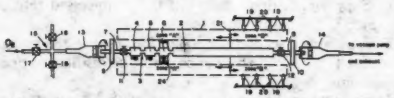


1. A purifying process for dehydration and deoxidation of fluoride glass comprising the step of heating fluoride glass to temperature between 500° C. and 800° C. to melt the glass in atmosphere of fluoride nitrogen (NF_3) to react radical fluorine atom dissociated from NF_3 with hydroxyl group, complex ion and oxide included in the fluoride glass.

4,597,787

MANUFACTURE OF OPTICAL FIBRE PREFORMS

Amnon Jacobson, Tel-Aviv, Israel, assignor to Ispra Fibroptics Industries Herzlia Ltd., Israel

Filed Nov. 13, 1984, Ser. No. 670,169
Int. Cl.[4] C03B *37/014, 37/018*
U.S. Cl. 65—3.12 **9 Claims**

1. In a method of producing a glass preform useful for drawing optical fibres, which comprises

forming a system comprising a glass tube having a first end operatively connected to a chamber,

charging the chamber with solid silicon,

effecting a reduced pressure in the system of 10^{-8} to 10^{3} microns Hg,

heating the silicon to a temperature up to 1500° C. so as to evaporate the same while maintaining the reduced pressure in the system, whereby the glass tube is not deformed during the evaporation,

externally cooling said tube from the end opposite the first end towards the first end to a temperature at which said silicon condenses as a liquid, thereby causing deposition of

the silicon as a liquid layer on the inner surface of the tube from the other end to the first end,

passing oxygen through said tube from the first end to the other end, thereby oxidizing the deposited silicon to silica and forming a uniform silica coating on the inner surface of the glass tube, and

forming a coating of a metal oxide on said silica coating by evaporation of a metal and oxidation thereof in the same manner as with the silica, or by evaporation of a metal oxide and deposition thereof by cooling on the silica, whereby the metal oxide diffuses into the silica to dope the same.

4,597,788

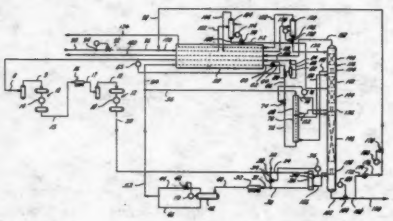
PROCESS FOR RECOVERING ETHANE, PROPANE AND HEAVIER HYDROCARBONS FROM A NATURAL GAS STREAM

Fred P. Apffel, Houston, Tex., assignor to Flexivol, Inc., Houston, Tex.

Division of Ser. No. 356,918, Mar. 10, 1982, Pat. No. 4,456,460. This application Apr. 9, 1984, Ser. No. 598,051

Int. Cl.[4] F25J *3/02*

U.S. Cl. 62—26 **2 Claims**



1. A process for separating methane from substantial amounts of heavier hydrocarbons in a mixed gas, comprising:

A. Cooling the mixed gas in a indirect heat exchanger with a mixed refrigerant;

B. Compressing the refrigerant in two stages of compressors;

C. Separating the methane from substantial amounts of heavier hydrocarbons of the mixed gas in a distillation column using the compressed refrigerant to provide heat energy for the distillation, such refrigerant supplying such heat energy prior to the cooling in Step A;

D. Splitting the compressed refrigerant from step C into two portions;

E. Supplying a first portion of the compressed refrigerant of Step C for cooling in Step A;

F. Supplying a second portion of the compressed refrigerant of Step C to provide heat energy for the distillation prior to the cooling in Step A;

G. Supplying the second portion of the compressed refrigerant of Step F for cooling in Step A;

H. Feeding the first portion of the compressed refrigerant of Step E to the second stage compressor; and

I. Feeding the second portion of the compressed refrigerant of Step G to the first stage compressor

2. Apparatus for separating methane from substantial amounts of heavier hydrocarbons in a mixed gas, comprising:

Indirect heat exchange means for cooling the mixed gas in a indirect heat exchanger with a mixed refrigerant;

Compression means including a first and a second stage compressor for compressing the refrigerant;

Distillation column means for separating the methane from substantial amounts of heavier hydrocarbons of the mixed gas, said distillation column means including heat exchange reboiler means for using the compressed refrigerant to provide heat energy for the distillation, such refrigerant supplying such heat energy prior to the cooling in said indirect heat exchanger;

Means for splitting the compressed refrigerant from said heat exchange reboiler means into two portions; each having the same composition;

First supply means for supplying a first portion of the compressed refrigerant from said heat exchange reboiler mean to said indirect heat exchange means;

Second supply means for supplying a second portion of the compressed refrigerant from said heat exchange reboiler means to provide heat energy to said distillation column means;

Third supply means for supplying the second portion of the compressed refrigerant from said second supply means to said indirect heat exchange means;

Means for feeding the first portion of the refrigerant from said indirect heat exchange means to said second stage compressor; and

Means for feeding the second portion of the refrigerant from said indirect heat exchanger to said first stage compressor.

4,597,789

TUNGSTEN ALLOY BENDING MOLD INSERTS

Thomas J. Reese, Sarver, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 12, 1985, Ser. No. 764,465

Int. Cl.[4] C03B *23/02*

U.S. Cl. 65—106 **15 Claims**

1. A bending mold for shaping a hot glass sheet by sag bending comprising:

a glass sheet support frame having a shaping rail with a support surface that conforms in elevation and outline to the desired shape of the sheet to be shaped slightly inboard of the glass sheet perimeter; and

tungsten metal containing inserts positioned at selected positions on said rail to support said glass sheet on said frame during said sag bending.

4,597,790

METHOD OF PRODUCING UNBAKED AGGLOMERATES

Seiji Matsui, Kawasaki; Kazuharu Yatsunami, Yokohama; Tsuneo Miyashita, Yokohama, and Noboru Sakamoto, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed May 21, 1985, Ser. No. 736,329

Claims priority, application Japan, May 30, 1984, 59-108662

Int. Cl.[4] C22B *1/08*

U.S. Cl. 75—3 **8 Claims**

1. A method of producing unbaked agglomerates in the form of cold bonded pellets or briquettes comprising the steps of:

adding a binder to an iron oxide-type raw material containing iron ore fines, baked pellet undersized powder or dust powder originating from iron works,

producing green pellets or briquettes from said binder-added raw material, and

drying and curing said green pellets or briquettes,

wherein at least one selected from the group consisting of reduced iron powder containing 10 wt. percent or more of metal iron, mill scale powder containing 20 wt. percent or more of FeO, or iron sand containing 20 wt. percent or more of FeO is compounded to said raw material in an amount of 5–30 wt. percent of said raw material.

4,597,791

GOLD RECOVERY PROCESSES

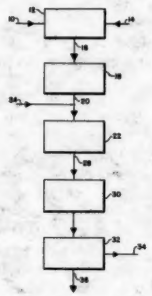
George B. Siddall, Attadale, Australia, assignor to Bateman Engineering (International) Limited, Boksburg North, South Africa

Filed Nov. 8, 1984, Ser. No. 669,434

Claims priority, application Australia, Nov. 8, 1983, PG2269; Jun. 22, 1984, PG5642

Int. Cl.[4] C22B *11/00*

U.S. Cl. 75—118 R 8 Claims



1. A process for the separation of gold from particulate material containing gold, comprising the steps of:

(a) introducing a hydrophobic liquid and a non-gold particulate hydrophobic bulking material into an aqueous environment so as to pre-form agglomerates containing said bulking material;

(b) introducing said pre-formed agglomerates and said particulate material containing gold into an aqueous liquid, so that the agglomerates contact the gold to form gold bearing agglomerates; and

(c) separating the gold bearing agglomerate from the aqueous liquid.

4,597,792

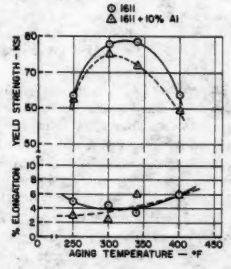
ALUMINUM-BASED COMPOSITE PRODUCT OF HIGH STRENGTH AND TOUGHNESS

Donald Webster, Saratoga, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Jun. 10, 1985, Ser. No. 742,830

Int. Cl.[4] B22F *3/00*

U.S. Cl. 75—249 26 Claims



1. An aluminum-based metallic product comprised of a first aluminum-based metal having a yield strength of at least about 30 ksi, having dispersed therein particles of a second aluminum-based metal having an impact toughness of at least about 20 foot-pounds.

4,597,793

DESENSITIZING INK FOR WET OFFSET PRINTING

Albert Amon, and Roger M. Weil, both of Lausanne, Switzerland, assignors to Sicpa Holding S.A., Prilly-Lausanne, Switzerland

Filed Mar. 4, 1983, Ser. No. 472,110

Claims priority, application Switzerland, Mar. 5, 1982, 1345/82

Int. Cl.[4] C09D *11/00*

U.S. Cl. 106—21 12 Claims

1. A desensitising ink for wet offset printing on an acceptor surface of a chemical duplicating set having at least two superimposed sheets, one of the facing surfaces of which has an electrophilic acceptor coating and the other a nucleophilic coating capable of producing a chromogenic reaction with said electrophilic acceptor coating, wherein the desensitising ink comprises an alkoxylated nucleophilic compound and emulsified water within the ink bulk, the amount of said emulsified water in said ink bulk being sufficient for at least partial wetting of the hydrophilic areas of an offset printing plate.

4,597,794

RECORDING PROCESS AND A RECORDING LIQUID THEREOF

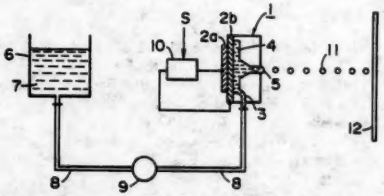
Tokuya Ohta, Yokohama; Yasuhiro Yano, Naka; Yohji Matsufuji, Tokyo; Masahiro Haruta, Funabashi, and Tsuyoshi Eida, Chiba, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 532,298, Sep. 14, 1983, abandoned, which is a continuation of Ser. No. 251,090, Apr. 6, 1981, abandoned. This application Jul. 3, 1984, Ser. No. 628,114

Claims priority, application Japan, Apr. 17, 1980, 55-51891; Apr. 17, 1980, 55-51892; Apr. 17, 1980, 55-51895; Apr. 17, 1980, 55-51897; May 6, 1980, 55-59602; May 6, 1980, 55-59603; May 7, 1980, 55-60431

Int. Cl.[4] C09D *11/02*

U.S. Cl. 106—20 13 Claims



1. An ink-jet recording process which comprises forming droplets of an ink and recording on an image receiving material by using the droplets, said ink being prepared by dispersing fine particles of pigment into an aqueous dispersion medium containing a polymer which has both an ethylenically unsaturated carboxylic acid substituent as a hydrophilic portion and an aromatic ring substituent as a hydrophobic portion and an average molecular weight sufficient to contribute to the dispersion stability of said pigment particles without increasing the viscosity of the ink higher than about 20 cps and wherein said hydrophilic portion constitutes from 2 to 40 weight percent of said polymer.

4,597,795

6-TETRAHYDROFURFURYLAMINOFLUORAN COMPOUND USEFUL AS A COLOR FORMER

Hideyuki Sensui, Tokyo; Susumu Suzuka, Yono; Michihiro Gonda, Kitamoto, and Katsumasa Kikkawa, Tokyo, all of Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

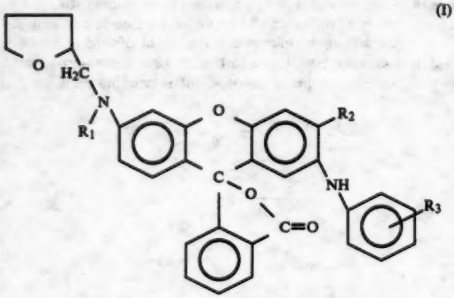
Filed Jan. 22, 1985, Ser. No. 693,116

Claims priority, application Japan, Mar. 5, 1984, 59-40526; Apr. 3, 1984, 59-65097

Int. Cl.[4] C07D *493/10*

U.S. Cl. 106—21 3 Claims

1. A 6-tetrahydrofurfurylaminofluoran compound of the formula (I):



(I)

wherein R_1 represents a member selected from the group consisting of a hydrogen atom, alkyl radicals having 1 to 8 carbon atoms, a tetrahydrofurfuryl radical, a phenyl radical, an alkylphenyl radical in which the alkyl group has 1 to 5 carbon atoms, and cyclic alkyl radicals having 3 to 8 carbon atoms; R_2 represents a member selected from the group consisting of a hydrogen atom, chlorine atom, fluorine atom, alkyl radicals having 1 to 5 carbon atoms, alkoxy radicals having 1 to 5 carbon atoms, alkoxyalkyl radicals having 2 to 10 carbon atoms, a phenyl radical, and a benzyl radical; and R_3 represents a hydrogen atom, chlorine atom, fluorine atom, alkyl radicals having 1 to 5 carbon atoms, and acyl radicals having 2 to 7 carbon atoms.

3. A heat-sensitive color-former comprising at least one 6-tetrahydrofurfurylaminofluoran compound as claimed in claim 1.

4,597,796

ONE-COMPONENT ALKALI METAL SILICATE CEMENT COMPOSITION

Josef Ernst, Eppstein, and Hans-Joachim Semmler, Hochheim am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 26, 1984, Ser. No. 634,803

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1983, 3327176

Int. Cl.[4] C04B *19/04*

U.S. Cl. 106—74 8 Claims

1. A dry surfactant-free one-component alkali metal silicate cement composition which contains the following components:

(a) metal phosphate hardener in amounts of 2–10% by weight selected from the group consisting of condensed aluminum phosphate and condensed iron/aluminum phosphate,

(b) rounded quartz sand having a grain size between 0.01 and 0.5 mm in amounts of 30–70% by weight,

(c) clay constituents in amounts of 10–40% by weight,

(d) kieselguhr in amounts of 1–5% by weight,

(e) mineral oil in amounts of 0.05–1% by weight and

(f) solid pulverulent sodium silicate, potassium silicate or mixtures thereof in amounts of 10–25% by weight.

4,597,797

COMPOSITION OF MATTER USEFUL FOR AGGLOMERATING A METAL-CONTAINING ORE MATERIAL

Herm J. Roorda, Rijswijk, and Max J. Jipping, Driebergen, both of Netherlands, assignors to Akzo nv, Arnhem, Netherlands

Continuation of Ser. No. 260,213, May 4, 1981, abandoned, which is a division of Ser. No. 741,981, Nov. 15, 1976, Pat. No. 4,288,245. This application Aug. 16, 1982, Ser. No. 408,675

Claims priority, application Netherlands, Nov. 20, 1975, 7513554

Int. Cl.[4] C08K *3/10, 3/26, 5/09;* C08L *1/28*

U.S. Cl. 106—194 8 Claims

1. A composition of matter useful for agglomerating a metal-containing ore material in the presence of water and an alkali metal salt of carboxymethyl cellulose as a binder, the composition consisting essentially of an alkali metal salt of carboxymethyl cellulose and one or more salts derived from an alkali metal and a weak acid having a pK value higher than 3 and a molecular weight lower than 500, in an amount of at least 2%, calculated on the weight of the alkali metal salt of carboxymethyl cellulose, said composition being essentially free of polyvalent metal salts as well as acid ingredients which cause carbon dioxide to evolve from sodium carbonate.

4,597,798

METHOD FOR DISSOLVING CELLULOSE IN ORGANIC SOLVENTS AND RESULTING CELLULOSE SOLUTIONS

Masami Kamata; Iwao Tabushi, both of Kyoto; Saichi Morimoto, Tsuruga; Takashi Asaeda, Jyoyo, and Yoshikazu Aoki, Otsu, all of Japan, assignors to Tachikawa Research Institute, Kyoto, Japan

Filed Dec. 26, 1984, Ser. No. 686,376

Claims priority, application Japan, Dec. 26, 1983, 58-249468

Int. Cl.[4] C08L *1/00*

U.S. Cl. 106—203 21 Claims

1. A method for preparing a cellulose solution comprising the steps of dissolving cellulose with a mixed solvent consisting essentially of at least one aliphatic quaternary ammonium halide having a formula: $R_1R_2R_3R_4NX$, wherein each of R_1, R_2, R_3, and R_4 is a lower alkyl group and X is a halogen, and at least one organic solvent selected from the group consisting of dimethyl sulfoxide and tetramethylene sulfoxide.

4,597,799

CATIONIC BITUMINOUS EMULSIONS AND EMULSION AGGREGATE SLURRIES

Peter Schilling, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Feb. 21, 1985, Ser. No. 703,914

Int. Cl.[4] C08L *95/00;* C09D *3/24;* B01J *13/00*

U.S. Cl. 106—277 19 Claims

1. A cationic bituminous emulsion comprising from about 30% to about 80% by weight of bitumen, from about 0.1% to about 10% by weight of an emulsifier selected from the group consisting of reaction products of a polyamine reacted with a member of the group consisting of epoxidized unsaturated fatty acids of chain lengths between C_8 and C_{22} and the esters thereof and adding water to make up 100% by weight, the emulsion having a pH in the range of from 2–7.

13. A paving slurry seal mixture of a cationic aqueous bituminous emulsion and mineral aggregate capable of being worked comprising: a densely graded mineral aggregate passing through No. 4 and at least 80% retained on 200 mesh screen; from about 8% to about 20% of an oil in water type emulsion, based on the weight of the mineral aggregate, wherein the emulsion is comprised of from about 55% to about 65% bitumen, based on the weight of the emulsion, from about

0.5% to about 2% of a cation-active emulsifier selected from the group consisting of reaction products of a polyamine reacted with a member of the group consisting of epoxidized unsaturated fatty acids of chain lengths between C_8 and C_{22} and the esters thereof, based on the weight of the emulsion, and adding water to make up 100% by weight of the emulsion, the emulsion having a pH in the range of from 2-7; from about 4% to about 16% water, based on the weight of the mineral aggregate, added to form a slurry of the aggregate and the emulsion; and up to 3% of an inorganic or organic additive to reduce the setting time of the mixture.

4,597,800

OXO-ALUMINUM COMPLEXES

John H. W. Turner, Chapel-en-le-Frith, England, assignor to Manchem Limited, Manchester, England

Continuation-in-part of Ser. No. 269,218, Jun. 2, 1981, abandoned, which is a continuation-in-part of Ser. No. 144,554, Apr. 28, 1980, abandoned. This application Dec. 19, 1984, Ser. No. 684,883

Claims priority, application United Kingdom, Apr. 30, 1979, 7915027; European Pat. Off., Apr. 24, 1980, 80301329.1

Int. Cl.[4] C09D *3/26*; C07F *5/06*

U.S. Cl. 106—264 12 Claims

1. An oxo-aluminum complex of the formula

$$O'_{a+1}(Al-X)_a(Al-OR_bX_{2-b})_2$$

wherein

—OR is an alkoxy group in which R is an alkyl group containing from 1 to 4 carbon atoms or an alkoxyalkyl group containing 4 to 6 carbon atoms;

X is a substituent derived by elimination of a hydrogen atom from an enolate or a mixture of substituents comprising at least one substituent derived by elimination of a hydrogen atom from an enolate and one or more substituents derived by elimination of a hydrogen atom from an alcohol containing more than 4 carbon atoms, a phenol, a carboxylic acid, a mono-ester of a dicarboxylic acid or a di-ester of a tricarboxylic acid;

O' is an oxygen atom which bridges two aluminum atoms;

a is an integer of 2 or more; and

b has the value of 0.5, 1, 1.5 or 2 with the proviso that $2b/a+2$ is less than 0.33, wherein said oxo-aluminum complex has a substantial residual alkoxide content and a substantial absence of hydroxyl groups thereby resulting in a significant stabilizing effect.

10. An air-drying composition comprising an oxo-aluminum complex according to claim 1 and a synthetic resin.

4,597,801

SILANE DISPERSING AGENT FOR MAGNETIC MEDIA

Julius J. Stratta, Yorktown Heights, and Nicholas Stasiak, Yonkers, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 655,585, Sep. 28, 1984, abandoned. This application Jun. 4, 1985, Ser. No. 741,265

Int. Cl.[4] B01F *17/00*

U.S. Cl. 106—308 Q 22 Claims

1. A dispersing agent comprising (a) a silane selected from the group consisting essentially of a silylated copolyether of the general formula:

$$[R^3O(C_mH_{2m}CHO)_x(CH_2-CH_2O)_y-C_wH_{2w}]_z-Si-[OR^1]_{4-(z+a)}$$

(with R^2 and R_a^4 substituents)

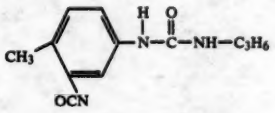
where R^1 is individually a hydrogen atom, an alkyl group having from 1 to 12 carbon atoms, an alkoxy alkyl group having from 2 to 12 carbon atoms, or an acyl group having from 6 to 12 carbon atoms; R^2 is individually a hydrogen atom, an alkyl group having from 1 to 18 carbon atoms or an aryl group having from 6 to 18 carbon atoms; R^3 is individually a hydrogen atom, an alkyl group having from 1 to 12 carbon atoms, an aryl group having from 6 to 18 carbon atoms or an aryl alkyl group having from 7 to 18 carbon atoms; R^4 is individually an alkyl group having 1 to 4 carbon atoms; the sum of $x+y$ has a value of from 2 to 100; z has a value of 1, 2 or 3; w has a value 0 to 6; m has a value of 1, 2 or 3; and a has a value of 0 or 1;

and an isocyanato silane of the general formula:

$$OCN-R^5-Si-(OR^7)_{3-b}$$

(R_b^6 substituent)

where R^6 is individually an alkyl group having 1 to 4 carbon atoms; R^7 is individually a hydrogen atom, an alkyl group having from 1 to 12 carbon atoms, an alkoxy alkyl group having from 2 to 12 carbon atoms or an acyl group having from 6 to 12 carbon atoms; b is 0, 1, 2 or 3; and R^5 is an alkylene, arylene or aralkylene group having from 1 to 18 carbon atoms or a group of the formula:



and (b) a phosphate ester of the general formula:

$$[R^8(OCH_2-C(R^9)H)_c(OCH_2-CH_2)_dO]_e-P(=O)-[OA]_{3-e}$$

where R^8 is a hydrogen atom or an alkyl group containing from 1 to 20 carbon atoms; R^9 is a hydrogen atom, an alkyl group containing from 1 to 4 carbon atoms, an aryl group containing from 6 to 18 carbon atoms; or an alkylaryl group containing from 7 to 17 carbon atoms; the sum of $c+d$ has a value of from 0 to 100; e has a value of 1 or 2; and A is a hydrogen, sodium, potassium or lithium atom or an NH_4 group; where the ratio of silane to phosphate ester is 10:90 to 99:1 when the silane is a silylated copolyether and 35:65 to 99:1 when the silane is an isocyanato silane.

4,597,802

LEVELING COMPOSITION

Johan Alexanderson, Tegnérgatan 7, S-111 40 Stockholm, and Ake Skarendahl, Emblavägen 4, S-182 63 Djursholm, both of Sweden

Filed Apr. 10, 1984, Ser. No. 598,917

Claims priority, application Sweden, Apr. 19, 1983, 8302202

Int. Cl.[4] C04B *7/00*

U.S. Cl. 106—315 14 Claims

1. A levelling composition based on hydraulic binder, a levelling compound and ballast to be applied to an uneven moisture-containing support, containing a salt which does not essentially affect the strength of the composition when set and which is present in such an amount and has such capacity as to reduce the relative equilibrium humidity in the gas phase of said composition before drying to a value of less than about 95%, said salt being selected from the group consisting of lithium halides, calcium chloride, calcium bromide, calcium iodide, potassium nitrite, potassium formate, and potassium propionate, and mixtures thereof, and being present as an amount in the range of from about 0.5 to about 5 weight percent of the dry contents of said composition.

4,597,803

PROCESS FOR CLEANING VESSELS CONTAINING SULFUR DICHLORIDE

Mark J. Stodolka, Sanborn, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 602,564, Apr. 20, 1984, Pat. No. 4,545,822. This application Jun. 10, 1985, Ser. No. 742,839

The portion of the term of this patent subsequent to Oct. 8, 2002, has been disclaimed.

Int. Cl.[4] B08B 9/08

U.S. Cl. 134—10 16 Claims

1. A process for cleaning vessels containing liquid sulfur dichloride comprising the steps of:

(a) removing substantially all of the liquid sulfur dichloride from the vessel leaving a solids-containing liquid slurry on the bottom of the vessel,

(b) heating the contents of the vessel in the presence of an inert gas to a temperature sufficient to vaporize the liquid remaining in the vessel leaving a solid residue,

(c) removing the vapor from the vessel by vacuum,

(d) neutralizing the vapor, and

(e) removing the solid residue from the bottom of the vessel.

4,597,804

METHODS OF FORMING DENUDED ZONE IN WAFER BY INTRINSIC GETTERING AND FORMING BIPOLAR TRANSISTOR THEREIN

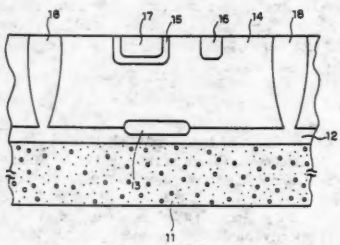
Kazunori Imaoka, Komae, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation-in-part of Ser. No. 356,486, Mar. 9, 1982, abandoned. This application Apr. 12, 1984, Ser. No. 598,544

Claims priority, application Japan, Mar. 11, 1981, 56-35021; Mar. 11, 1981, 56-35022; Mar. 11, 1981, 56-35023; Mar. 11, 1981, 56-35024

Int. Cl.[4] H01L 21/263, 21/322

U.S. Cl. 148—1.5 25 Claims



1. A method for producing a semiconductor device on a silicon wafer utilizing the function of the intrinsic gettering effect or a silicon wafer having a shallow or surface zone which is a denuded zone and a having deep or internal region containing a high concentration of crystalline defects which are large in size, comprising the step of annealing the silicon wafer at an annealing temperature selected from a range of 500° through 1300° C. by heating the silicon wafer such that the annealing temperature corresponds to a first temperature selected from a range of 500° through 900° C., and increasing the annealing temperature to a second temperature selected from a range of 950° through 1300° C., the annealing temperature being increased from the first temperature to the second temperature at a rate not exceeding 14° C./min.

4,597,805

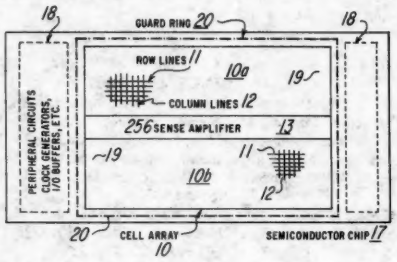
MAKING GUARD RING FOR REDUCING PATTERN SENSITIVITY IN MOS/LSI DYNAMIC RAM

G. R. Mohan Rao, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 83,928, Oct. 11, 1979. This application Feb. 15, 1985, Ser. No. 702,177

Int. Cl.[4] H01L 21/26, 27/04

U.S. Cl. 148—1.5 6 Claims



1. A method of making a guard-ring in a face of a body of semiconductor material, the guard ring substantially surrounding an array of transistors at said face to prevent unwanted carriers from entering the area of said array, comprising the steps of:

forming a deep heavily-doped region of one conductivity type in said body of semiconductor material adjacent said face thereof; the semiconductor material contiguous to said deep heavily-doped region being much more lightly doped with impurity of said one type,

and thereafter forming a shallow heavily-doped region of opposite conductivity type above said deep heavily-doped region to provide guard ring surrounding a cell array area of said face.

4,597,806

PROCESS FOR MAINTAINING THE ZINC CONTENT IN ZINC PHOSPHATE BATHS

Dieter Hauffe, Frankfurt am Main, Fed. Rep. of Germany, assignor to Parker Chemical Company, Madison Heights, Mich.

Filed Jul. 2, 1985, Ser. No. 751,102

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1984, 3427729

Int. Cl.[4] C23F 7/08

U.S. Cl. 148—6.15 Z 6 Claims

1. A process for maintaining a given zinc content in nickel-containing zinc phosphate baths, comprising taking a sample from said bath, adding dimethylglyoxime to said sample to precipitate nickel, adding a copper comples compound to said sample, determining the zinc content by titrating the sample against a copper sensitive electrode with a volumetric solution containing a complexing agent for zinc and copper and automatically metering a zinc-containing supplementary concentrate to said bath based on the deviation from the determined zinc content and said given zinc content.

4,597,807

ACCELERATED CARBURIZING METHOD WITH DISCRETE ATMOSPHERES

Michael L. Fenstermaker, Danielsville, and Mark A. Pellman, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

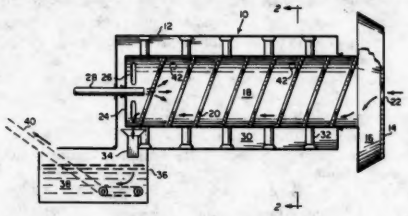
Filed Nov. 13, 1984, Ser. No. 670,706

Int. Cl.[4] C21D 1/74

U.S. Cl. 148—16.5 10 Claims

1. In a method for carburizing ferrous metal articles in a furnace in which a heat source is in a discrete zone segregated,

but not physically isolated from the carburizing zone where the articles are processed and there is flow communication between the zones, the improvement comprising introducing a carburizing mixture of an oxygenated hydrocarbon and a hydrocarbon enriching gas into the carburizing zone substantially without any inert gas while introducing an inert gas into the zone of the heat source substantially without any carburizing mixture.

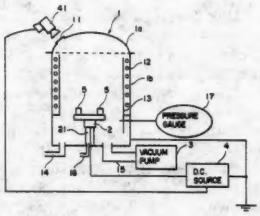


4,597,808

PROCESS FOR ION NITRIDING ALUMINUM OR ALUMINUM ALLOYS

Hideo Tachikawa, Aichi; Takatoshi Suzuki, Anjo; Hironori Fujita, Aichi, and Tohru Arai, Toyoake, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan

Filed Mar. 29, 1985, Ser. No. 718,788
Claims priority, application Japan, Apr. 5, 1984, 59-68208
Int. Cl.[4] C21D *1/48*
U.S. Cl. 148—20.3 18 Claims



1. A process for ion nitriding an article of aluminum or of aluminum alloy, comprising the steps of

disposing the article in a sealed vessel;

removing residual oxygen gas from the vessel;

heating the surface of said article to a prescribed nitriding temperature by introducing a heating gas into said vessel and by applying a voltage to start an electro discharge therein;

activating the surface of said article by introducing an activating gas into said vessel and subjecting the surface to sputtering; and

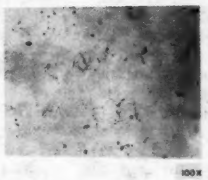
ion nitriding the surface of said article by introducing a nitriding gas into said vessel and applying a voltage to start an electro discharge therein, thereby forming an aluminum nitride layer having high hardness and wear resistance.

4,597,809

HIGH STRENGTH HOT CORROSION RESISTANT SINGLE CRYSTALS CONTAINING TANTALUM CARBIDE

David N. Duhl, Newington, and Otis Y. Chen, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 10, 1984, Ser. No. 578,903
Int. Cl.[4] C22C *19/05*
U.S. Cl. 148—404 4 Claims



1. A high strength corrosion resistant nickel base single crystal superalloy article which comprises: a matrix consisting essentially of

9.5–14% chromium
7–11% cobalt
1–2.5% molybdenum
3–6% tungsten
1–4% tantalum
3–4% aluminum
3–5% Titanium
6.5–8% aluminum + titanium
0–1% columbium
balance essentially nickel

said matrix containing from about 0.4 to 1.5 volume % of a phase based on tantalum carbide, said article having at least twice the hot corrosion resistance (measured at 1650° F.) and at least twice the 1% creep life (measured 1600° F./55 ksi) when compared with a similar article having the same matrix but without intentional tantalum carbide contents.

4,597,810

TRACER UNIT FOR AMMUNITION

Neal E. Trickel, 1911 10th St., and Sherwood V. Strommen, P.O. Box 111, both of Monroe, Wis. 53566

Filed Jun. 20, 1985, Ser. No. 747,051
Int. Cl.[4] C06B *45/14*
U.S. Cl. 149—15 11 Claims

1. A tracer unit for ammunition comprising

(a) a base charge including about 75 to about 90 weight % strontium peroxide, about 5 to about 15 weight % calcium resinate and about 5 to about 10 weight % magnesium; and

(b) an igniter charge covering said base charge and including about 40 to about 60 weight % calcium resinate, about 20 to about 30 weight % stontium nitrate and about 20 to about 30 weight % magnesium.

4,597,811

PREVENTION OF UNWANTED CURE CATALYSIS IN ISOCYANATE CURED BINDERS

Marjorie E. Ducote, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 3, 1985, Ser. No. 751,702
Int. Cl.[4] C06B *45/10*
U.S. Cl. 149—19.92 4 Claims

1. In a process of compounding and mixing a propellant composition comprised of a first portion of propellant ingredients comprising a diioscyanate curable binder system selected from the group consisting of a hydroxyl terminated polybuta-

diene binder, a crosslinked double base binder, and a polyester binder; a solid oxidizer of variable particle size ammonium perchlorate ranging from ultra fine to coarse; aluminum metal fuel; a metal-containing burn rate catalyst-ballistic modifier; and an optional bonding agent for coating the ammonium perchlorate oxidizer; and a second portion of said propellant composition comprising a diisocyanate curing agent; a curing catalyst of triphenyl bismuthine; and a difunctional acid selected from oxalic and maleic or the anhydride of maleic acid; the improvement in the compounding and mixing process to first achieve the prevention of unwanted cure catalysis directly effecting a decreased pot life while subsequently permitting the cure catalysis of triphenyl bismuthine to achieve the proper curing of said propellant composition comprised of said first and said second portions, said improvement in the compounding and mixing process comprising:

(i) compounding and mixing said first portion of said propellant composition in a first vessel for a predetermined time of about 90 minutes under vacuum, said compounding order being the incremental addition of said aluminum metal fuel to said diisocyanate curable binder system, followed by the incremental addition of said metal-containing cure catalyst, the incremental addition of said coarse particle size ammonium perchlorate, the incremental addition of said ultra fine ammonium perchlorate, and the addition of said optional bonding agent for coating said ammonium perchlorate oxidizer;

(ii) compounding said second portion of said propellant composition in a second vessel which comprises adding a predetermined amount of said triphenyl bismuthine and a predetermined amount of said difunctional acid to a predetermined amount of said diisocyanate curing agent;

(iii) mixing said second portion of said propellant composition for a predetermined time from about 30 minutes to about one hour to form a preblend of a more reactive diisocyanate and for a predetermined time from about 30 minutes to about three hours to form a preblend of less reactive diisocyanate; and

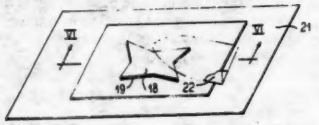
(iv) adding said preblend containing said diisocyanate curing agent, said triphenyl bismuthine, and said difunctional acid to said first portion of said propellant composition and continue mixing at high speed, under vacuum, for about 15 minutes to achieve a pot life ranging from about 4¼ hours to about 11¼ hours as compared with a pot life of 0 hours to about 1¼ hours when no difunctional acid is employed in said preblend.

4,597,812

HANDICRAFT BONDING

Bonnie Hamilton, Eugene, Oreg., assignor to Solar-Kist Corporation, LaGrange, Ill.

Filed Feb. 21, 1984, Ser. No. 581,811
Int. Cl.[4] B44C *1/10*
U.S. Cl. 156—63 **19 Claims**



17. A method of handicraft bonding by use of adhesive which at least in one phase is in a fluent state for adherence to a compatible surface, comprising:

laminating by fusion onto the back surfaces of a plurality of appliqué pieces a heat reactivable adhesive;

separating one of said pieces and the adhesive lamina thereon from the other pieces;

providing the separated piece as one of a pair of members to be bonded to one another;

assembling said pair of members in face-to-face relation with said adhesive lamina therebetween;

applying to the assembled members having said lamina of adhesive therebetween an essentially nonporous self-supporting overlay sheet characterized by having all of the attributes of being thin, reusable, substantially frictionless, translucent and nonadherent with respect to said adhesive lamina;

placing a pressing surface of pressure applying means onto said applied overlay sheet;

exerting bonding pressure by means of said pressure applying means through said overlay sheet toward said members and thereby squeezing the adhesive lamina between said members;

effecting bonding of the pressurized assembled members by means of said adhesive lamina;

preventing by means of the protective layer provided by the overlay sheet any contamination of said pressing surface by adhesive that may migrate beyond the member which is contiguous to said pressing surface during said squeezing;

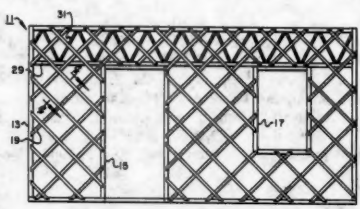
and finally removing said pressure applying means and said overlay sheet from said bonded members.

4,597,813

METHOD OF MAKING A REINFORCED PREFORMED BUILDING WALL

Jim L. Hipkins, Box 165A, K-3, Fort Worth, Tex. 76140

Filed Sep. 21, 1984, Ser. No. 652,964
Int. Cl.[4] B32B *31/06*
U.S. Cl. 156—79 **6 Claims**



1. A method of forming a building wall, comprising:

providing an outer frame that is located in a plane for defining the perimeter of the wall;

providing a plurality of stiffening members, each stiffening member having slot means for interconnecting with other stiffening members;

interconnecting the stiffening members within the frame in an X-shaped diagonal pattern with the stiffening members located in the plane of and extending to the outer frame;

connecting to the outer frame the ends of the stiffening members which extend to the outer frame to provide reinforcement; then

filling the frame with a hardenable plastic foam.

4,597,814

METHOD FOR MANUFACTURING CARD WITH THREE-DIMENSIONAL LABEL INCORPORATED THEREIN

Gilbert Colgate, Jr., New York, N.Y., assignor to U.S. Banknote Corporation, New York, N.Y.

Continuation of Ser. No. 584,387, Nov. 22, 1983, abandoned.
This application Sep. 23, 1985, Ser. No. 778,766
Int. Cl.[4] B31F *5/04*
U.S. Cl. 156—219 **2 Claims**

1. A method of manufacturing an identification card incorporating an image viewable as three-dimensional comprising the steps of:

printing information on a sheet of plastic material;

forming a raised pattern on a sheet of material different from

said plastic material to create a holographic image viewable as three-dimensional;

coating said raised pattern sheet with an adhesive which promotes bonding to said plastic material;

attaching a pressure sensitive adhesive to one side of the coated and raised pattern sheet, the pressure sensitive adhesive extending over less than half the surface of said one side;

placing said coated and raised pattern sheet on one surface of said sheet of plastic material so that said pattern sheet is

PRINTING ON PLASTIC BLANK
EMBOSSING HOLOGRAM ON SHEET
COATING WITH ADHESIVE
APPLY PRESSURE SENSITIVE ADHESIVE ON ONE SIDE
SEPARATE LABELS AND STRIP ON LINER
OVERLAMINATE AND APPLY HEAT AND PRESSURE

attached to said sheet of plastic material by said pressure sensitive adhesive;

overlaminating such surface of said plastic material with a transparent plastic layer to form a sandwich; and

applying heat and pressure to said sandwich to fuse said overlaminating layers to said sheet of plastic material, said coated and raised pattern sheet having sufficiently higher melting point so that the image remains and is viewable as three-dimensional through an overlaminated layer and so that said coated and raised portion is bonded on said one side to said plastic sheet.

4,597,815

TRANSFER PRINTING

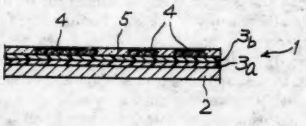
Yuzo Nakamura, Muko, Japan, assignor to Nissha Printing Co., Ltd., Kyoto, Japan

Filed Nov. 25, 1981, Ser. No. 325,054

Claims priority, application Japan, Nov. 29, 1980, 55-168241; Feb. 10, 1981, 56-18658; Apr. 16, 1981, 56-57705; May 20, 1981, 56-73976[U]; May 22, 1981, 56-75094[U]

Int. Cl.⁴ B41M *3/12, 5/26;* B44C *1/16*

U.S. Cl. 156—235 **11 Claims**



1. A method of coloring the surface of an object comprising a first step of providing a sheet of transfer material consisting essentially of a substrate, a layer of thermoplastic material formed on said substrate, and a design layer formed on said layer of thermoplastic material, said thermoplastic material being heat-sensitive and characterized in being non-tacky at room temperatures, further characterized by being activated upon being heated and remaining activated for a predetermined period of time after termination of said heating, solidifying to effect complete adhesion upon lapse of said predetermined period of time;

a second step of heating said sheet to a temperature at which said thermoplastic layer becomes tacky, and a third step of transferring said design layer from said sheet to the surface of said object;

said transferring step comprising pressing a transfer pad against said design layer of said sheet of transfer material so that said design layer and said thermoplastic layer are transferred to the surface of said pad, and then pressing said pad surface with said transferred layers thereon against the surface of said object so that said design and thermoplastic layers are transferred from said pad surface to said surface of said object.

4,597,816

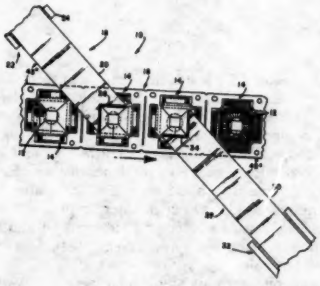
SCRAP-LESS TAPING SYSTEM FOR IC LEAD-FRAMES

Robert V. Barnhart, York, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Sep. 3, 1985, Ser. No. 772,231

Int. Cl.⁴ B32B *31/08, 31/18*

U.S. Cl. 156—263 **4 Claims**



1. In a scrap-less taping system for taping the leads of integrated circuit lead-frames formed as units on a continuous web of material, said material being intermittantly fed in a given direction of movement through a plurality of work stations, the steps comprising: feeding a first strip of tape from a first supply thereof to a first work station; removing a first right-angled segment from said first strip of tape and applying said first segment to a lead-frame wherein said first segment secures two adjacent sides of said lead-frame; and feeding a second strip of tape from a second supply thereof to a second work station and removing a second right-angled segment from said second strip and applying said second segment to said lead-frame wherein said second segment secures the two adjacent sides of said lead-frame opposite to the sides secured by said first segment.

4,597,817

PROCESS FOR THE PREPARATION OF A WATER-IMPERVIOUS SURFACE COATING

Ebbe D. Larsen, Tåstrup, Denmark, assignor to Aktieselskabet Jens Villadsens Fabriker, Herlev, Denmark

Filed Sep. 28, 1984, Ser. No. 655,430

Claims priority, application Denmark, Sep. 29, 1983, 4486/83

Int. Cl.⁴ B32B *31/00;* E04B *2/00*

U.S. Cl. 156—280 **11 Claims**

1. A process for the preparation of a strong and water-impervious surface coating on an indoor substrate, said process comprising the steps of (a) applying to the substrate a layer of an aqueous bitumen emulsion containing, based on dry matter, 5–55% by weight of an acrylic prepolymer, 1–15% by weight of an air-drying alkyd resin and 40–80% by weight by bitumen and 0–5% by weight of additives, (b) applying a glass fibre layer directly onto said bituminous layer after said bituminous layer has at least partially dried out, and (c) applying to the

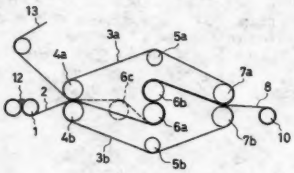
glass fibre layer applied in step (b) at least one layer of a paint comprising an aqueous, non-bituminous dispersion of at least one film-forming material.

4,597,818

METHOD FOR PRODUCING LAMINATED SHEETS OR FILMS

Takeo Aoyama; Syoji Magara; Shigeki Yokoyama, all of Yokohama; Tadashi Kamei, Yokosuka, and Mikio Uehara, Tokyo, all of Japan, assignors to Nippon Petrochemicals Company, Limited, Tokyo, Japan

Filed Jan. 24, 1985, Ser. No. 694,205
Claims priority, application Japan, Jan. 25, 1984, 59-11393
Int. Cl.[4] B65C *9/25*
U.S. Cl. 156—308.2 **6 Claims**



1. In a method for producing laminated sheets or films comprising at least one substrate layer and at least one layer of ultra-high molecular weight polyethylene, the improvement which comprises the steps of:

superposing at least one layer of ultra-high molecular weight polyethylene, said polyethylene characterized by an intrinsic viscosity of at least 8, as measured in a decalin solution at 135° C., in powder or preformed sheet form and at least one layer of a substrate of another material upon one face of a tensioned endless belt traveling around a set of rolls;

pressing said ultra-high molecular weight polyethylene layer between said substrate layer and said endless belt, or between said substrate layers, against at least one heating roll under the tension of said endless belt;

heating at least said ultra-high molecular weight polyethylene layer to a temperature above its melting point; and

thereby uniting said superposed ultra-high molecular weight polyethylene and at least one substrate layer into a laminating sheet or film.

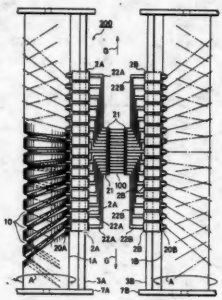
4,597,819

APPARATUS FOR ALTERING PITCH IN ARRANGEMENT OF WAFERS

Rei Kusuhara; Koichi Otsubo, and Yasuo Yatabe, all of Tokyo, Japan, assignors to Tomco Mfg., Ltd., Tokyo, Japan

Filed Dec. 18, 1984, Ser. No. 683,305
Claims priority, application Japan, Feb. 29, 1984, 59-38438
Int. Cl.[4] C23F *1/02*; H01L *21/00*
U.S. Cl. 156—345 **3 Claims**

1. An apparatus for altering a pitch in the arrangement of a plurality of wafers, comprising a pair of cylindrical grooved cams disposed parallelly to each other and provided each on the circumferential surface thereof with a plurality of cylindrical grooves, a plurality of pairs of moving elements disposed as opposed to each other between said pair of cylindrical grooved cams and provided severally with pins adapted to fit into said cylindrical grooves of said cylindrical grooved cams, a pair of means for retaining said moving elements in a state movable only in the direction of the axes of said pair of cylindrical grooved cams, a cylindrical grooved cam driving element for rotating said pair of cylindrical grooved cams in mutually opposite directions by equal angles, main grooves formed in the opposed faces of said moving elements and provided in the lower parts thereof with stepped parts for engagement with wafers, a pair of support frames for retaining said pair of cylindrical grooved cams and said pair of retaining means in prescribed relative positions, and a support frame moving element for changing the distance between said pair of support frames, wherein said cylindrical grooves are formed symmetrically with respect to each other on the circumferential surfaces of



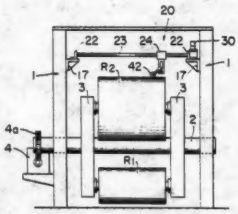
the respective cylindrical grooved cams in such a manner that the moving elements will be moved at desired dissimilar proportions in the direction of the axes of said cylindrical grooved cams in consequence of the rotation of said cylindrical grooved cams and will be always separated with equal pitch.

4,597,820

METHOD OF AND DEVICE FOR PREPARING PAPER ROLLS FOR ROTARY PRESSES AND THE LIKE

Yoshiki Nozaka, Tokyo, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 621,528, Jun. 18, 1984, Pat. No. 4,555,288. This application Sep. 6, 1985, Ser. No. 773,347
Claims priority, application Japan, Jun. 20, 1983, 58-110665
Int. Cl.[4] B31F *5/06*; B65H *19/18*
U.S. Cl. 156—353 **3 Claims**



1. A device for preparing for splicing a new paper roll for a rotary press or the like, the paper roll being rotatably supported and having a web leading edge held against raveling by a plurality of pieces of strong adhesive tape, said device comprising: a traveling structure mounted for traveling parallelly to and in the vicinity of the web leading edge from one end to the other end of the paper roll; a rotary perforating wheel supported by the traveling structure with freedom to be pressed against and be separated from the surface of the paper roll; driving means for thus moving the rotary perforating wheel against and away from the paper roll surface; tape detecting means so supported on the traveling structure as to detect the adhesive tape pieces as the traveling structure thus travels and to output corresponding detection signals; and control means operating in response to the detection signals to activate the driving means to move the rotary perforating wheel against and along only the adhesive tape pieces and thereby to form a tearable perforated line across only the adhesive tape pieces substantially over and along the web leading edge, whereby tearing of the tape pieces and peeling of

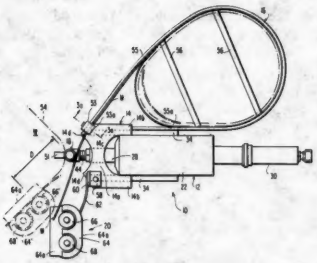
the web leading edge part immediately prior to web splicing are facilitated.

4,597,821

PORTABLE EDGE BANDER FOR HAND HELD AND TABLE MOUNTED OPERATION

Alick R. Munro, 1055 Greg St., Sparks, Nev. 89431

Filed Aug. 26, 1983, Ser. No. 526,844
Int. Cl.[4] B32B *31/00*; B44C *7/00*; B29B *1/00*
U.S. Cl. 156—500 9 Claims



1. An apparatus for adhesively applying a major surface of a band of material to an edge surface of a panel, said apparatus comprising:

a base plate having a bottom,

a hot melt adhesive gun,

means for mounting said gun to the base plate with its longitudinal axis parallel to the bottom of the base plate,

said hot melt adhesive gun having a discharge nozzle projecting beyond a transverse edge of the plate,

an extrusion tip carried by said nozzle at right angles to the plane of the base plate, and including orifice means defining a linear bead of melted adhesive at right angles to the panel for application to one of a panel edge between the top and bottom surfaces of the panel defining said edge, and said band when on edge and presented thereto,

means operatively coupled to said base plate for pressing said band against said panel edge at a point downstream of the area of contact of the adhesive with the panel edge;

a band storage magazine mounted to said base plate, laterally to the side of said extrusion tip opposite that side facing said means for operatively pressing the band relatively against the panel edge downstream of the area of initial contact of the hot melt adhesive with said panel edge;

said magazine including means for storing said band on edge for feed from the magazine,

upright guide means carried by said plate adjacent the extrusion tip for guiding said on edge band into upright surface contact with said extrusion tip and for upright surface contact with said pressing means downstream of said extrusion tip; and

means for selectively causing said orifice means to face one of said contacting surface of said on edge band and said panel edge surface, such that a controlled glue line is affixed to the panel edge or said upright band major surface with minimal waste of adhesive; the glue line is consistently applied with uniform thickness without gumming up the finished product or the banding apparatus and wherein the adhesive becomes sticky prior to contact of the band with the panel edge downstream of said extrusion tip;

and wherein said means mounted on said base plate for guiding said band and said panel along predetermined converging paths comprises a plurality of rollers mounted for rotation about axes parallel to the planes of movement to the major surface of the band and the edge surface of the panel, said rollers having respective peripheral surfaces in contact with each other and engaging respectively the edge surface of the panel and the major surface of the band so that forcibly moving the edge surface of the panel in contact with one of the rollers causes another of the rollers to drive the band of material in the same direction and at the same velocity.

4,597,822

METHOD FOR MAKING SILICON WAFERS

John L. Benjamin, Liverpool, and William R. Van Dell, North Syracuse, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Mar. 28, 1985, Ser. No. 717,364
Int. Cl.[4] C30B *25/18*
U.S. Cl. 156—612 3 Claims

1. A method for producing a silicon wafer comprising:

grinding first and second opposed surfaces of a slice of single-crystal silicon to a predetermined flatness, thickness and parallelism;

said thickness being sufficient to provide enough strength for subsequent handling;

depositing a layer of silicon on said first surface;

said layer having a thickness sufficient to provide enough strength for subsequent handling; and

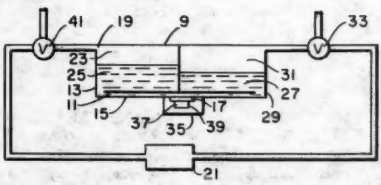
grinding away an excess portion of said slice of single-crystal silicon from said second surface to reduce said thickness of said slice to a final predetermined thickness.

4,597,823

RAPID LPE CRYSTAL GROWTH

Melvin S. Cook, P.O. Box 38, Saddle River, N.J. 07458

Filed Sep. 12, 1983, Ser. No. 531,230
Int. Cl.[4] C30B *19/02*
U.S. Cl. 156—622 2 Claims



1. A method of growing an epitaxial layer of a material on a surface of a substrate from a solution, comprising the steps of positioning said surface of the substrate at a first side of a first channel having at the location of said substrate a breadth which is substantially greater than the depth of said first channel, said first channel having an inlet communicating with a reservoir of solution and an outlet communicating with a receiver of solution, forcing at least part of said solution from the reservoir to enter the first channel via said inlet so as to flow through the first channel across said surface of said substrate and to leave the first channel via said outlet and to enter the receiver, said first channel being configured such that streamline flow of said at least part of said solution takes place in the region of said surface of said substrate, causing a coolant fluid to flow in a second channel while in heat exchange relationship

with the substrate to lower the temperature of said substrate relative to the saturation temperature of said at least part of said solution entering said first channel, thereby to induce the growth of an epitaxial layer of material on said surface, said growth of said epitaxial layer of said material on said surface of said substrate taking place during said flow of said solution through said first channel.

4,597,824

METHOD OF PRODUCING SEMICONDUCTOR DEVICE

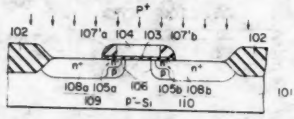
Kazuyoshi Shinada, and Masaki Sato, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 9, 1984, Ser. No. 670,010

Claims priority, application Japan, Nov. 11, 1983, 58-212050; Nov. 24, 1983, 58-220976; Aug. 7, 1984, 59-165134

Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **18 Claims**



1. A method of producing a semiconductor device comprising the steps of:

(a) forming a gate oxide film on a semiconductor substrate of a first conductivity type;

(b) forming a gate electrode on said gate

(c) forming a doped oxide film in which impurities of the first conductivity type and impurities of a second conductivity type are doped on said semiconductor substrate;

(d) forming a nitride film on the both side regions of the gate electrode on said doped oxide film; and

(e) implementing heat treatment in the atmosphere of oxygen to form impurity regions of the first conductivity type in a region below said nitride film and impurity regions of the second conductivity type having a depth smaller than that of said impurity regions of the first conductivity type, and to form second impurity regions of the second conductivity type having an impurity concentration larger than that of said impurity regions of the second conductivity type.

4. A method according to claim 1, wherein said step of forming said nitride film comprises the steps of forming a nitride film on said doped oxide film and on the side walls of said gate electrode, and etching said nitride film by reactive ion etching to leave said nitride film only on the side walls of said gate electrode.

4,597,825

INTERMEDIATE PASSIVATION AND CLEANING OF COMPOUND SEMICONDUCTOR SURFACES

John L. Freeouf, Peekskill; Thomas N. Jackson, Ossining, both of N.Y.; Peter Oelhafen, Basel, Switzerland; George D. Pettit, Mahopac, and Jerry M. Woodall, Bedford Hills, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 440,654, Nov. 10, 1982. This application Apr. 2, 1985, Ser. No. 718,987

Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **6 Claims**

1. The method of providing intermediate processing passivation for a monocrystalline multielement compound semiconductor member comprising in combination the steps of:

immersing said semiconductor member in a bath of 1:1 $HCl:H_2O$ while illuminating said multielement semiconductor member for a duration of from 10-30 minutes with a light having a photon energy greater than the energy gap width of said semiconductor at a power density of greater than 0.01 watts/cm^2.

4,597,826

METHOD FOR FORMING PATTERNS

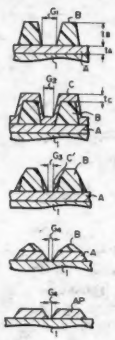
Teiji Majima, Hatano, and Hiromichi Watanabe, Atsugi, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 26, 1984, Ser. No. 686,521

Claims priority, application Japan, Dec. 26, 1983, 58-244334; Dec. 28, 1983, 58-245287; Oct. 4, 1984, 59-208784

Int. Cl.[4] C23F *1/02;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **26 Claims**



1. A method for forming a pattern having a fine gap on a substrate, comprising the steps of:

(a) depositing a layer of a pattern material on the surface of said substate;

(b) forming an etching mask pattern having a first gap on said pattern material layer;

(c) depositing a pattern-widening overlying layer which substantially maintains the topography of the mask pattern on the exposed surfaces of said pattern material layer and on the mask pattern, thereby forming a second gap which is smaller than the first gap; and

(d) etching said overlying layer and said pattern material layer by ion etching employing energized particles of an inert gas, thereby forming said pattern having said fine gap which is smaller than said second gap from said pattern material layer.

4,597,827

METHOD OF MAKING MIS FIELD EFFECT TRANSISTOR HAVING A LIGHTLY-DOPED REGION

Akito Nishitani, and Yoshiaki Katakura, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Feb. 21, 1985, Ser. No. 704,012

Claims priority, application Japan, Feb. 29, 1984, 59-36252

Int. Cl.[4] H01L *21/306, 21/22;* **B44C** *1/22;* **C03C** *15/00*

U.S. Cl. 156—643 **6 Claims**

1. A method of making MIS field effect transistors having a lightly-doped drain region in a semiconductor of one conductivity type, comprising the steps of:

(a) forming a gate insulating layer on a major surface of said semiconductor substrate;

(b) forming a masking layer on said gate insulating layer;

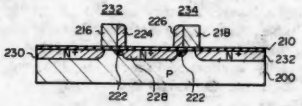
(c) forming an opening in a selected portion of said masking layer;

(d) forming a conductive layer on the major surface of the structure obtained above;

(e) anisotropicaly etching said conductive layer till the surface of said gate insulating layer is exposed, to form two spaced gate electrodes in said opening and at the opposite ends of said masking layers;

(f) ion-implanting impurities of an opposite conductivity type into the surface of said semiconductor substrate through said gate insulating layer to form a lightly-doped region beneath said opening;

(g) forming an insulating layer on the major surface of the structure obtained above;



(h) anisotropicaly etching said insulating layer to expose the surface of said gate insulating layer, thereby forming two spaced side-wall spacers on one ends of said gate electrodes;

(i) completely removing said exposed masking layer to form two spaced gate regions, each consisting of a composite structure of said gate electrode and said side-wall spacer; and

(j) ion-implanting impurities of the opposite conductivity type into said semiconductor substrate by the use of said gate regions as a masking layer to form a heavily-doped drain region between said spaced gate regions, while heavily-doped source regions are formed outside said gate regions in said semiconductor substrate, whereby said lightly-doped drain region is formed under said side-wall spacer.

4,597,828

METHOD OF MANUFACTURING PRINTED CIRCUIT BOARDS

Jehane Tadros, Mississauga, Canada, assignor to Firan Corporation, Oakville, Canada

Filed Mar. 25, 1985, Ser. No. 715,618

Int. Cl.[4] B44C *1/22;* C03C *15/00;* C23F *1/02;* B29C *17/08*

U.S. Cl. 156—643 **14 Claims**

1. A method of preparing a printed circuit board comprising etching the external surface of a synthetic resin substrate board without metal cladding to provide a microporous structure in surface layers of the board which are free of fibrous reinforcement, freeing said surface layers of etchant residues, subjecting said surface to a plasma treatment in a plasma additively reactive with surface groups of the resin to provide modified surface groups promoting adherence to a metallization layer, metallizing the plasma treated surfaces by vacuum deposition or sputtering to provide a thin layer of copper, selectively electroplating the copper layer with a much thicker layer of copper in accordance with a desired circuit pattern, and etching away unplated areas of the metallization layer.

4,597,829

STENCIL, STENCIL MATERIAL KIT AND STENCIL DUPLICATOR KIT CONTAINING THE SAME

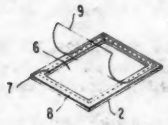
Morio Sato, and Tatsuya Igawa, both of Kanagawa, Japan, assignors to Pilot Man-Nen-Hitsu Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 601,880, Apr. 19, 1984, abandoned, which is a division of Ser. No. 540,979, Oct. 11, 1983, Pat. No. 4,550,660. This application Mar. 7, 1985, Ser. No. 709,278

Claims priority, application Japan, Oct. 8, 1982, 57-176405; Dec. 28, 1982, 57-200779[U]

Int. Cl.[4] B44C *1/22;* C03C *15/00, 25/06;* B29C *17/08*

U.S. Cl. 156—644 **17 Claims**



1. A method of preparing a patternwise perforated stencil which comprises:

drawing a pattern using a patternwise perforated stencil-making solution comprising a water-soluble acid solution, on a stencil comprising a porous support and a masking film formed on the support, wherein the masking film comprises a water-insoluble polymer containing tertiary amino groups, wherein said polymer is one which can be made soluble in water or an aqueous solution upon contacting with an acid; and

removing the resulting patternwise reaction product by using water or an aqueous solution.

4,597,830

METHOD AND PULPING COMPOSITION FOR THE SELECTIVE DELIGNIFICATION OF LIGNOCELLULOSIC MATERIALS WITH AN AQUEOUS AMINE-ALCOHOL MIXTURE IN THE PRESENCE OF A CATALYST

Gary C. April, Tuscaloosa, and Ramkrishna G. Nayak, University, both of Ala., assignors to The University of Alabama, University, Ala.

Filed Jun. 20, 1983, Ser. No. 505,972

Int. Cl.[4] D21C *3/20*

U.S. Cl. 162—32 **11 Claims**

1. A pulping liquor for the delignification of lignocellulosic material consisting essentially of:

(A) a low molecular weight aliphatic alcohol selected from the group consisting of methanol, ethanol, butanol, pentanol and mixtures thereof;

(B) an aliphatic amine selected from the group consisting of ethylene diamine, propylene diamine, hexamethylene diamine, methylaniline, ethylamine and mixtures thereof; and

(C) water, wherein each of (A), (B), and (C) are present in amounts of 1–12 parts by volume, said liquor further comprising a catalyst selected from the group consisting of anthraquinone, benzoquinone, napthaquinone, phenazine, derivatives thereof and mixtures thereof present in amounts of grams of catalyst per milliliter of pulping liquor in a range of about 0.1:4 to 0.001:15.

5. A process for the delignification of cellulosic materials, comprising:

cooking said cellulosic material with a pulping liquor consisting essentially of a low molecular weight aliphatic alcohol selected from the group consisting of methanol, ethanol, butanol, pentanol and mixtures thereof, an aliphatic amine selected from the group consisting of ethylene diamine, propylene diamine, hexamethylene diamine, methylaniline, ethylamine and mixtures thereof and water,

wherein said alcohol, amine and water are each present in amounts of 1–12 parts by volume, said cooking further being conducted in the presence of a catalyst selected from the group consisting of anthraquinone, benzoquinone, napthaquinone, phenazine, derivatives thereof and mixtures thereof, said catalyst being present in amounts of grams of catalyst per milliliter of pulping liquor in a ratio of about 0.1:4 to 0.001:15, at a temperature of about 140°–200° C. for a period of about 50–360 minutes, wherein the ratio of grams of cellulosic material to milliliters of pulping liquor is about 1:4 to 1:15.

4,597,831

USE OF FOAM IN SURFACE TREATMENT OF PAPER

Thomas E. Anderson, 1 Gibbs Hill, Headcorn, Ashford, Kent, England

Continuation of Ser. No. 546,425, Oct. 28, 1983, abandoned, which is a continuation-in-part of Ser. No. 956,983, Oct. 31, 1978, abandoned. This application Jun. 17, 1985, Ser. No. 745,369

Claims priority, application United Kingdom, Nov. 8, 1977, 46444/77; May 31, 1978, 46444/77

Int. Cl.[4] D21H *1/34*

U.S. Cl. 162—135 7 Claims

1. A method of externally sizing a paper sheet or board, which comprises

applying to a surface of the paper sheet or board a foam produced by foaming with a gas or vapor a foamable liquid consisting essentially of

a sizing agent of rosin or a derivative thereof and water,

in the substantial absence of an amount, sufficient to cause foaming of said liquid, of a compound which causes foaming other than said sizing agent itself, and

wherein the amount of sizing agent is a sizing-effective amount and sufficient to provide a stable foam, and

thereafter mechanically breaking down at least a major proportion of the applied foam in a manner such as to provide a substantially uniform application of the sizing agent over said surface area.

4,597,832

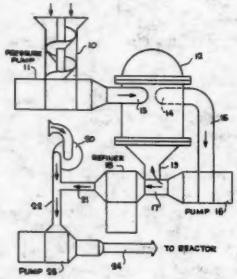
APPARATUS FOR CONVERTING BIOMASS TO A PUMPABLE SLURRY

Sabri Ergun, Hillsborough; Larry L. Schaleger, Oakland; James A. Wrathall, Berkeley, and Nasser Yaghoubzadeh, El Cerrito, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 1, 1981, Ser. No. 307,560

Int. Cl.[4] D21C *7/00*

U.S. Cl. 162—234 12 Claims



1. An apparatus for converting lignocellulosic material to a pumpable slurry comprising: means for receiving material to be converted, means for pressurizing the material to be converted, heated means operatively connected to said receiving means and said pressurizing means and having no moving mechanical elements therein for treating the material under pressure and temperature for a period of time, means operatively connected to said heated treating means for recirculating at least a portion of the treated material through said heated treating means, and refining means operatively connected to receive a portion of said treated material from said recirculating means for producing finely ground particles of said treated material.

4,597,833

PROCESS FOR THE REMOVAL OF DISSOLVED GAS FROM AN AQUEOUS SOLUTION OF ETHYLENE OXIDE

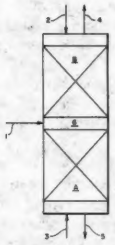
Henri Néel, Le Havre, and Francis Delannoy, Pierre-Benite, both of France, assignors to Atochem, France

Filed Jul. 16, 1984, Ser. No. 631,164

Claims priority, application France, Jan. 17, 1984, 84 00631

Int. Cl.[4] B01D *3/00, 19/00*

U.S. Cl. 203—49 7 Claims



1. A process for the removal of gases dissolved in an aqueous solution containing up to about 15% by weight of ethylene oxide and up to about 0.5% by weight of dissolved gases which are selected from carbon dioxide and at least one other compound that is normally gaseous, comprising contacting said aqueous solution of ethylene oxide with water and ethylene for a time and at a temperature and pressure sufficient to effect substantially complete removal of said dissolved gases; said contact taking place in a separation column having an upper and a lower zone and up to 15 theoretical plates in each zone with said aqueous solution of ethylene oxide being added intermediate said zones, said ethylene being added to the bottom of said lower zone, and said water being added to the top of the upper zone.

4,597,834

SEPARATION OF METHYL ACETATE FROM METHANOL BY EXTRACTIVE DISTILLATION

Lloyd Berg, and An-I Yeh, both of 1314 S. Third Ave., both of Bozeman, Mont. 59715

Division of Ser. No. 485,006, Apr. 14, 1983, Pat. No. 4,543,164. This application Feb. 17, 1984, Ser. No. 581,344

The portion of the term of this patent subsequent to Apr. 5, 2000, has been disclaimed.

Int. Cl.[4] B01D *3/40;* C07C *67/48*

U.S. Cl. 203—51 2 Claims

1. A method for recovering methyl acetate from a mixture of methyl acetate and methanol which comprises distilling a mixture of methyl acetate and methanol in a rectification column in the presence of an effective amount of an extractive agent, recovering essentially pure methyl acetate as overhead product and obtaining the extractive agent and methanol from the stillpot or reboiler, the extractive agent comprises at least dimethylsulfoxide.

4,597,835

STILL

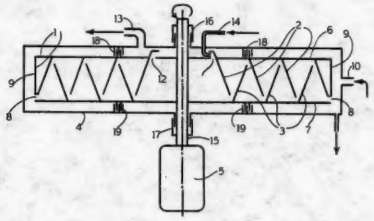
John Moss, "Sequoia", Gillotts La., Harpsden, Henley-on-Thames, Oxon. RG9 4HP, United Kingdom

Filed Nov. 28, 1984, Ser. No. 675,695

Claims priority, application United Kingdom, Dec. 14, 1983, 8333299

Int. Cl.[4] B01D 1/22

U.S. Cl. 203—89 13 Claims



1. A still for effecting separation of lighter and heavier components of a liquid mixture containing two or more components including a lighter component and a heavier component by multi-stage countercurrent distillation, said still comprising a housing, a hollow rotor rotatably mounted in the housing and having one or more outlets for liquid at the periphery thereof, means for rotating the rotor about its axis, a plurality of concentric lamellar bodies of thermally conductive material mounted in the hollow interior of said rotor so as to provide a labyrinthine path within the rotor both for liquid moving radially outwardly under centrifugal force and also for vapour moving radially inwardly with respect to the rotor in countercurrent to the direction of movement of said liquid, vaporising means for vaporising liquid to be distilled, liquid inlet means for introducing liquid to a radially inner part of the hollow interior of said rotor, vapour outlet means communicating with a radially inner part of the hollow interior of said rotor for removal of vapour enriched in lighter component, and liquid outlet means for removal of liquid enriched in heavier component from the housing, whereby in use vapour is constrained to move radially inwardly and liquid to move radially outwardly along said labyrinthine path under centrifugal force within said rotor in countercurrent one to another, fractionation taking place in a plurality of stages within the rotor and occurring at least in part by condensation of vapour on the radially outer surfaces of said lamellar bodies and by evaporation from liquid on the radially inner surfaces of said lamellar bodies, the heat of condensation resulting from said condensation of vapour on said radially outer surfaces being conducted through said lamellar bodies from the radially outer surfaces thereof to said radially inner surfaces thereof so as to provide heat of evaporation at the radially inner surfaces thereof for said evaporation.

13. A multi-stage countercurrent distillation process for separating lighter and heavier components of a liquid mixture which comprises:

(a) supplying the liquid mixture to a radially inner part of the interior of a hollow rotor arranged for rotation about its axis and having a plurality of concentric lamellar bodies of thermally conductive material mounted in the hollow interior thereof so as to provide a labyrinthine path within said rotor for liquid moving radially outwardly and for vapour moving radially inwardly with respedt to said rotor;

(b) rotating said rotor about its axis;

(c) providing vapour at a radially outer part of the hollow interior of said rotor;

(d) allowing liquid to move radially outwardly with respect to said rotor along said labyrinthine path and to undergo evaporation on the radially inner surfaces of said lamellar bodies;

(e) allowing vapour to move radially inwardly with respect to said rotor along said labyrinthine path and to condense on the radially outer surfaces of said lamellar bodies;

(f) permitting heat of condensation resulting from step (e) to be conducted through said lamellar bodies from the radially outer surfaces thereof to provide heat of evaporation for step (d) at the corresponding radially inner surfaces thereof;

(g) allowing vapour enriched in lighter component or components to exit the interior of said rotor from a radially inner part thereof;

(h) recovering vapour of step (g);

(i) allowing liquid enriched in heavier component or components to exit said rotor at the periphery thereof; and

(j) recovering liquid of step (i).

4,597,836

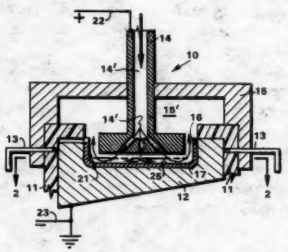
METHOD FOR HIGH-SPEED PRODUCTION OF METAL-CLAD ARTICLES

Glenn R. Schaer, Columbus, and Joseph R. Preston, Radnor, both of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 349,291, Feb. 16, 1982. This application Jul. 26, 1985, Ser. No. 759,526

Int. Cl.[4] C25D 1/02, 1/10, 1/20

U.S. Cl. 204—4 34 Claims



1. A method for the high-speed production of metal-clad plastic articles, comprising the steps of:

rapidly electroplating a metallic layer on a metallic surface by using a high current density and turbulent flow of an electroplating solution whose temperature is maintained at about 30° to 60° C., between an anode and said metallic surface, the distance between said anode and said metallic surface being about 1 to 4 mm;

contacting said metallic layer with a plastic material so as to obtain greater adhesion between said metallic layer and said plastic material than the adhesion between said metallic layer and said metallic surface; and

separating said metallic layer and said plastic material from said metallic surface;

said electroplating step comprising the steps of:

electroplating a smooth metallic layer on said metallic surface; and then

electroplating nodular growths on said smooth metallic layer so as to aid in the adhesion of said metallic layer to said plastic material;

the electroplating-solution flow rate to electroplate said smooth metallic layer being about 1 to 10 m/sec;

the electroplating-solution flow rate to electroplate said nodular growths on said smooth metallic layer being about 0.1 to 1 m/sec; and

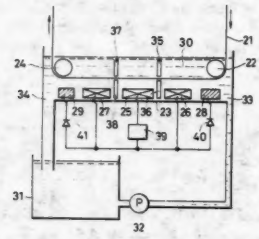
said high current density between said anode and said metallic surface being about 20 to 600 A/dm^2.

4,597,837

METHOD AND APPARATUS FOR ELECTROLYTIC TREATMENT

Kazutaka Oda; Yoshio Kon, and Tsutomu Kakei, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 5, 1984, Ser. No. 647,517
Claims priority, application Japan, Sep. 5, 1983, 58-162937
Int. Cl.[4] C25D 17/00; C25F 7/00
U.S. Cl. 204—14.1 10 Claims



1. A method of electrolytic treatment employing graphite electrodes wherein an asymmetrical waveform alternating current is applied to said electrodes to subject a metal article to continuous electrolytic treatment, comprising the steps of:

providing first graphite electrode means arranged confronting said metal article;

providing second and third graphite electrode means arranged respectively upstream and downstream of said first graphite electrode with respect to a direction of movement of said metal article;

providing auxiliary anode electrode means arranged respectively upstream and downstream of said second and third graphite electrode means; and

supplying a part of said asymmetrical waveform alternating current to said auxiliary anode electrode means so that a current causing a cathode reaction on surfaces of said graphite electrodes is larger than a current causing an anode reaction thereon.

4,597,838

ADDITIVE AGENT FOR ZINC ALLOY ELECTROLYTE AND PROCESS

Brian D. Bammel, Canton, Mich., assignor to OMI International Corporation, Warren, Mich.

Filed Aug. 29, 1985, Ser. No. 770,447
Int. Cl.[4] C25D 3/56
U.S. Cl. 204—44.2 20 Claims

1. An aqueous acidic electrolyte suitable for electrodepositing zinc alloys on a substrate comprising zinc ions and at least one additional metal ion selected from the group consisting of nickel, cobalt, iron and mixtures thereof present in an amount sufficient to electrodeposit a zinc alloy, and, for providing improved grain-refinement and enhancing the codeposition of the alloying metals in the zinc alloy deposit, an effective amount of an additive agent comprising a bath-soluble anionic carboxylated polyoxyalkylene compound derived from the carboxylation of:

(a) the polymerization of alkylene oxides selected from the group consisting of ethylene oxide, propylene oxide, glycidol, butylene oxide and mixtures thereof; and

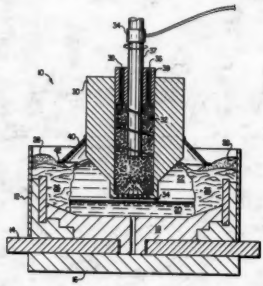
(b) the alkoxylation of mono and polyhydroxy compounds selected from the group consisting of hydroxyl containing alkyl, alkenyl, alkynyl, aryl, as well as mixtures thereof.

4,597,839

METHOD AND APPARATUS FOR PRODUCTION OF A METAL FROM METALLIC OXIDE ORE

Jack Y. Josefowicz, Westlake Village, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 14, 1983, Ser. No. 561,401
Int. Cl.[4] C25C 3/08, 3/14; C21C 7/00
U.S. Cl. 204—67 20 Claims



13. A process for electrolytically depositing a metal from a molten electrolyte comprising the steps of introducing particulates of a reducing agent into a container immersed in said molten electrolyte, providing an electrical current to said particulates of said reducing agent; and compressing said particulates to a pressure sufficient to deform same while said electrical current is being applied; said reducing agent having a particle size between about 5 and about 50 mesh.

4,597,840

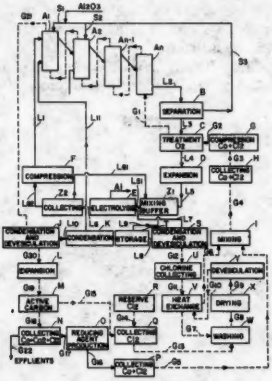
PROCESS FOR THE CONTINUOUS PRODUCTION OF ALUMINUM BY THE CARBOCHLORINATION OF ALUMINA AND IGNEOUS ELECTROLYSIS OF THE CHLORIDE OBTAINED

Joseph Cohen, Paris; Bernard Gurtner, Grenoble, and Yves Bertaud, St. Jean-de-Maurienne, all of France, assignors to Aluminum Pechiney, Paris, France

Continuation of Ser. No. 480,215, Mar. 30, 1983, abandoned.
This application Feb. 26, 1985, Ser. No. 705,415
Claims priority, application France, Mar. 31, 1982, 82 05894
Int. Cl.[4] C25C 3/06; C01F 7/60
U.S. Cl. 204—67 20 Claims

1. In a process for the production of aluminum by the electrolysis of anyhdrous aluminum chloride produced by the carbochlorination of alumnina in a reactor using a chlorinating agent and a carbonaceous reducing agent in a molten salt bath containing at least one alkali metal halide and/or alkaline-earth metal halide, the improvement which comprises carrying out the carbochlorination of the alumina and electrolysis of the aluminum chloride continuously in the same production loop using the molten salt bath emanating from the carbochlorination as the electrolysis bath and the molten salt bath emanating from electrolysis as the carbochlorination bath; wherein the molten salt bath intended for carbochlorination contains from 2 to 10% by molar weight anhydrous aluminum chloride and the molten salt bath forming the electrolysis bath contains from 4 to 40% by molar weight anhydrous aluminum chloride; and wherein said molten salt bath emanating from the carbochlori-

nation of alumina is deoxidized by treatment with a reducing medium formed by a mixture of CO and Cl_2 gases, the excess



of said reducing medium being injected into the carbochlorination reactor.

4,597,841

PROCESS OF RECOVERING LEAD FROM OLD LEAD ACCUMULATOR SCRAP AND REDUCTION PLATE FOR THIS PROCESS

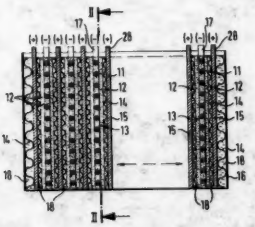
Rainer Kiessling, Anröchte; Voitech Plzák, and H. Wendt, both of Darmstadt, all of Fed. Rep. of Germany, assignors to Hagen Batterie AG, Fed. Rep. of Germany

Filed Jan. 23, 1985, Ser. No. 693,946

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1984, 3402338

Int. Cl.[4] C25C *1/14*

U.S. Cl. 204—115 **50 Claims**



1. A method for the recovery of lead from old lead accumulator scraps, comprising the steps of:

mechanically comminuting the old lead accumulators;

separating broken plastic from the remaining mixture of lead and lead compounds by sifting;

separating out coarser metal parts;

pressing a mixture of lead and lead compounds present as a powdered or granular mixture as a porous layer to a cathode plate arranged in a spaced relationship from an anode plate;

applying electrical current from the cathode plate to the anode plate, as the first electrolyzing step, in a first electrolyte solution having an initial first concentration of sulfuric acid, wherein the first concentration of sulfuric acid increases during said first electrolyzing step; and

subsequently applying electrical current from the cathode plate to the anode plate, as the second electrolyzing step, in a second electrolyte solution having an initial second concentration of sulfuric acid which is lower than the concentration of sulfuric acid in the initial first concentration of sulfuric acid used in said first electrolyzing step, wherein the second concentration of sulfuric acid increases during said second electrolyzing step.

4,597,842

METAL RECOVERY PROCESS

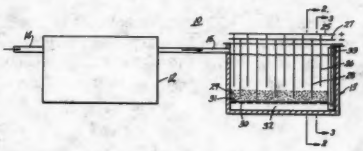
Joseph P. Evans, Chelmsford, England, assignor to Porters Grove Metal Recovery Co., Inc., Bridgeport, Conn.

PCT No. PCT/US85/00063, § 371 Date Feb. 19, 1985, § 102(e) Date Feb. 19, 1985, PCT Pub. No. WO85/03955, PCT Pub. Date Sep. 12, 1985

PCT Filed Jan. 16, 1985, Ser. No. 711,644

Int. Cl.[4] C25F *5/00*

U.S. Cl. 204—130 **18 Claims**



1. A method of removing metal from a solution having a relatively low metal content comprising the steps of providing a cell having side walls and a bottom wall and alternate anodes and cathodes depending thereinto, said cathodes depending below the anodes, establishing a bed of powdered metal on a perforate member above the bottom wall of said cell so as to establish a reservoir below said bed and permit fluid to filter through said bed, said cathodes extending into said bed, introducing a metal containing solution into said cell, electrically energizing said anodes and cathodes to produce electrolysis in said cell and establishing a cathodic potential on said bed, whereby metal deposits on said cathodes and on said bed, and removing solution from said reservoir.

4,597,843

ENHANCED BULK POROSITY OF POLYMER STRUCTURES VIA PLASMA TECHNOLOGY

Dennis W. Goupil, New Milford, Conn., and Mary T. Musolino, Bronx, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 12, 1984, Ser. No. 660,340

Int. Cl.[4] C07C *3/24*; B01D *39/02*

U.S. Cl. 204—165 **11 Claims**

1. A method for the preparation of a porous, polymer, shaped article which comprises subjecting a substantially nonporous polymer shaped article containing from about 1.0 to 30%, by weight, based on the total weight of the polymer, of a plasticizer, to a plasma treatment for about 10 to 500 seconds and at an exposure dose ranging from about 25 to 500 watts such that the plasticizer is volatized or decomposed into gaseous decomposition products thereby creating an internal pore structure while leaving the surface of the article essentially intact and free from microscopically visible pores.

4,597,844

COATING FILM AND METHOD AND APPARATUS FOR PRODUCING THE SAME

Akio Hiraki, Nishinomiya; Tatsuro Miyasato, Osaka, and Masao Hayashi, Wako, all of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Mar. 12, 1985, Ser. No. 711,018

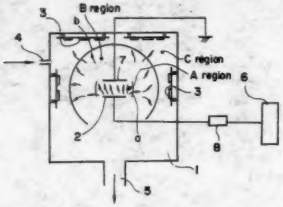
Claims priority, application Japan, Mar. 6, 1984, 59-46397; Aug. 6, 1984, 59-163795; Aug. 6, 1984, 59-163796

Int. Cl.[4] C23C *15/00*

U.S. Cl. 204—192 C **13 Claims**

1. An amorphous carbon coating film produced by sputtering a graphite target electrode in an atmosphere gas selected

from the group consisting of hydrogen, fluorine and a mixture of hydrogen and fluorine having a pressure of 6.665 to 666.5 Pa (0.05 to 5.0 Torr) while maintaining a temperature of a deposition substrate between a room temperature and 100° C. and a



relative current density which is a ratio of a plate current value to an area of target electrode for said graphite target electrode and an anode between 11.3 and 14.7 mA/cm^2 whereby the value of H/C or (H+F)/C in terms of an atomic ratio is made between 0.5 and 0.9.

4,597,845

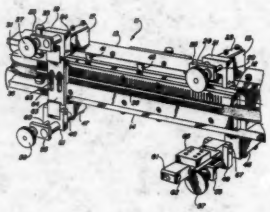
CONTINUOUS CONTACT PLATING APPARATUS

Jeffery E. Bacon, Long Beach; James E. Craig, South Pasadena, and Mark K. Pedersen, Yorba Linda, all of Calif., assignors to Robbins & Craig Welding & Mfg. Co., South El Monte, Calif.

Continuation-in-part of Ser. No. 654,760, Sep. 25, 1984, abandoned. This application Sep. 30, 1985, Ser. No. 782,120

Int. Cl.^{4} C25D *17/00, 17/14*

U.S. Cl. 204—206 **17 Claims**



1. A selective contact plater for continuously plating a plurality of zones, comprising:

a contained supply of plating solution having an avenue of escape;

an anode mounted in close proximity to the avenue of escape for the plating solution so that all the plating solution leaving the supply passes over the anode;

a porous belt means mounted in close proximity to the avenue of escape for the plating solution for absorbing some of the plating solution after it has passed the anode;

means for moving said belt means past the avenue of escape for the plating solution;

means for moving a web workpiece to be selectively plated past said porous belt means; and

means for receiving the web workpiece to be selectively plated, in the area of the avenue of escape for the plating solution, and guiding said web workpiece into contact with said belt means at those points on the web workpiece that are to be plated.

4,597,846

DEPASSIVATION LAYER ON AN ELECTRODE OF AN ELECTROCHEMICAL CELL

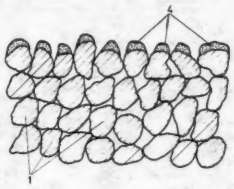
Eric Killer, Wettingen, and Günther Scherer, Gebenstorf, both of Switzerland, assignors to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland

Filed Jun. 27, 1984, Ser. No. 625,232

Claims priority, application Switzerland, Jun. 28, 1983, 3531/83

Int. Cl.^{4} C25B *1/34, 11/04*

U.S. Cl. 204—290 F **7 Claims**



1. An electrode for and electrochemical cell having a depassivation layer, comprising:

a porous metal substrate of a particulate structure, the surface of said substrate being provided with a depassivating layer wherein the top portion of the particles on the outermost layer of the substrate metal particles are coated with a depassivating metal leaving the pores of said outermost layer unfilled with depassivating metal and leaving portions of the particles of the outermost layer uncoated with depassivating metal, said depassivating layer being composed of electrically conductive oxides and/or suboxides of said substrate metal and at least one noble metal and/or noble metal oxide, an the metal of said substrate being at least one of titanium, zirconium, tantalum and niobium.

4,597,847

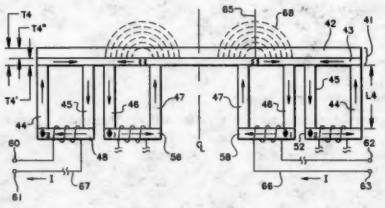
NON-MAGNETIC SPUTTERING TARGET

Donald R. Boys, Cupertino, Calif., assignor to IODEP, Inc., San Jose, Calif.

Filed Oct. 9, 1984, Ser. No. 658,738

Int. Cl.^{4} C23C *15/00*

U.S. Cl. 204—298 **11 Claims**



1. A composite sputtering target structure used in a magnetron sputtering device having a plurality of magnetic pole faces, comprising:

a non-magnetic sputtering material; and

a magnetic backing plate bonded to said non-magnetic sputtering material, said magnetic backing plate configured to be placed in contact with said plurality of magnetic pole faces to form a magnetic shunt between said pole faces.

4,597,848

ELECTRODE FOR MEASUREMENT OF ION ACTIVITY

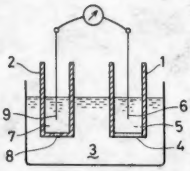
Syotaro Oka, Muko; Shu Tahara, Nagaokakyo, and Yaichiro Shibazaki, Hino, all of Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Continuation of Ser. No. 272,210, Jun. 10, 1981, abandoned. This application Nov. 28, 1984, Ser. No. 675,517

Claims priority, application Japan, Jun. 16, 1980, 55-81844; Jun. 16, 1980, 55-81845; Aug. 26, 1980, 55-117990

Int. Cl.[4] G01N *27/46*

U.S. Cl. 204—418 15 Claims



1. A membrane electrode for insertion into an ion-containing liquid in a vessel for measuring the electromotive force generated across the interface of said electrode and said liquid for determining the ion activity of said liquid, said electrode comprising an electrode body for containing an inner electrolyte and an inner electrode and an amphoteric ion-exchange membrane forming at least part of the wall of the electrode body and separating the electrolyte and the ion-containing liquid for defining said interface, the membrane comprising a homogeneous mixture of ionic groups of opposite charges, one of the ionic groups being present in an amount significantly larger than the other.

4,597,849

GAS SENSOR SUITABLE FOR ENGINE EXHAUST GASES

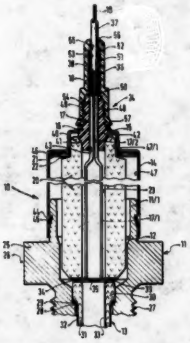
Joachim Burkhardt, Fellbach; Manfred Dreyer, Kornwestheim; Dittmar Klett, Pleidelsheim, and Helmut Weyl, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 18, 1984, Ser. No. 611,848

Claims priority, application Fed. Rep. of Germany, May 28, 1983, 3319486

Int. Cl.[4] G01N *27/46*

U.S. Cl. 204—424 13 Claims



1. A gas sensor suitable for mounting in the wall of a duct through which a gas to be measured as to its composition passes, comprising a metallic casing (11) of an external configuration having a central axis and being suitable for mounting in a duct wall, a sensor element (13) being held in said casing and projecting out therefrom to the measurement gas end of the sensor, a closure shell (14), being connected to said casing and extending therefrom away from said measurement gas end and having at its end closure away from said measurement gas end of the sensor a central aperture (16) which is aligned with said axis and through which a connection conductor leads out of the interior of the closure shell, said conductor being sealed in said aperture by a seal element (41) having an axial bore through which said conductor passes, and further comprising:

a metallic connection part (17) of elongated configuration, being aligned with said axis and at least partially surrounding said axis, being constituted so as to be rigid against torsion and being electrically connected to said sensor element (13) by contact with a conductor path (33) disposed on an interior surface of a solid electrolyte piece (31) thereof and extending, as a single centrally located outward leading metallic connection conductor for said sensor element, out of said casing (11) and through and out of said closure shell (14), passing through said bore of said element (41) and having a sleeve connection region (18) on a portion of said connection part protruding out of the measurement-gas-remote end of said seal element (41), a second conductor path of said sensor element being disposed on the exterior surface of said solid electrolyte piece (31);

a connection cable being electrically connected and fastened axially in said sleeve connection region (18) of said connection part (17), said cable having, beyond its fastening in said region of said connection part, an insulating covering (37);

a sealing tube (51), of yielding material of substantially constant wall thickness and capable of being slipped lengthwise into place, being disposed around said connection region (18) over said connection part (17) and over the adjacent insulation-covering end section of said connecting cable (19); and

an overlay shell (52) having a close-fitting mid-bore (53) being forced over said sealing tube (51) so as to compress it inwardly while forcing it axially, to seal said midbore (53) and to seal the contact surface between said end of said seal element (41) and the adjacent end of said sealing tube.

4,597,850

OXYGEN SENSOR

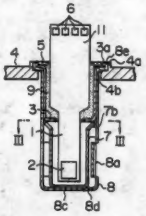
Toru Takahasi, Mito, and Sadayasu Ueno, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 2, 1985, Ser. No. 719,145

Claims priority, application Japan, Apr. 2, 1984, 59-63369; Jun. 1, 1984, 59-110770

Int. Cl.[4] G01N *27/12, 27/58*

U.S. Cl. 204—426 8 Claims



1. An oxygen sensor of a double cylinder type, comprising:

a sensor element;

an inner cylindrical member formed with gas ports, said inner cylindrical member housing said sensor element and being closed at a bottom end thereof;

an outer cylindrical member enclosing said inner cylindrical member, said outer cylindrical member being closed at a bottom end thereof;

wherein said gas ports are formed at a peripheral wall of said inner cylindrical member in positions in which they are not in face-to-face relation to the sensor element; and

wherein gas ports are formed at a peripheral wall of said outer cylindrical member in positions in which they are not in face-to-face relation to the gas ports formed at the peripheral wall of the inner cylindrical member.

4,597,851

PROCESS FOR THE UTILIZATION OF WASTE WATERS IN THE HYDROGENATION OF COAL

Eckard Wolowski, Mülheim, and Hans-Friedrich Tamm, Recklinghausen, both of Fed. Rep. of Germany, assignors to Ruhrkohle Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Jun. 25, 1984, Ser. No. 624,105

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1983, 3322784

Int. Cl.⁴ C10G *1/06, 1/00*

U.S. Cl. 208—400 **5 Claims**

1. In a coal hydrogenation process which includes the steps of:

(a) hydrogenating coal in a reactor (7);

(b) separating the reactor product from said reactor (7) in a hot precipitator (13) into a first phase comprising gas and vapor (23), and a second phase comprising liquids and solids (17);

(c) introducing said liquid and solid phase (17) into a vacuum distiller (15) in which steam jet booster pumps (49) produce a vacuum in said vacuum distiller (15), thereby rendering a heavy oil or solvent (3) and a condensate product (51) from the steam of the steam jet booster pumps (49), which condensate product (51) contains tar acid;

(d) introducing said vapor and gas phase (23) into a cold precipitator (19) into which cold precipitator, quenching water (21) (23) is introduced in order to prevent blockages caused by the crystallization of ammonium salts;

(e) distilling the products of said cold precipitator (19) in an atmospheric distiller (25) into which stripping steam (27) is introduced and from which atmospheric distiller (25) light and medium oils (29), solvent (33) and a waste phase (35) are produced, which waste water phase contains tar acids;

the improvement wherein:

at least a portion of said condensate (51) from the steam of the steam jet booster pumps (49) of said vacuum distiller (15) (produced in step (c) is injected into said cold precipitator (19) as quenching water (73-21-23); and wherein

at least a portion of said waste water phase (produced in step (e) is injected into said cold precipitator (19) as quenching water (71-21-23).

4,597,852

STATIC MIXER RETORTING OF OIL SHALE

Earl D. York, 6315 S. Geneva Cir., Englewood, Colo. 80111; Jay C. Knepper, 448 N. Austin, Apartment 2J, Oak Park, Ill. 60302, and John M. Forgac, 13 Oak Tree Ct., Elmhurst, Ill. 60126

Filed Sep. 30, 1985, Ser. No. 782,204

Int. Cl.⁴ C10G *1/00;* C10B *53/00*

U.S. Cl. 208—427 **10 Claims**

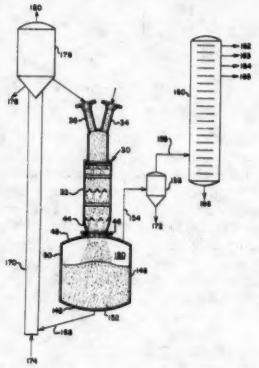
1. A process for mixing and retorting raw oil shale, comprising the steps of:

feeding raw oil shale to an upper free-fall section of a generally upright static mixer having a vertical axis, said raw oil shale being fed to the top of said upper free-fall section at an angle of inclination ranging from about 5 degrees to about 45 degrees relative to said vertical axis;

feeding spent oil shale to said upper free-fall section of said static mixer at a sufficient retorting temperature to retort said raw oil shale, said spent oil shale being fed to the top of said upper free-fall section at an angle of inclination ranging from about 5 degrees to about 45 degrees relative to said vertical axis and at an acute angle of inclination relative to said raw shale feed;

intersecting and colliding said raw and spent shale in said upper free-fall section and moving said shale generally downwardly through said free-fall section in a free-fall flow pattern by gravity flow;

substantially completely mixing and randomly distributing said raw and spent oil shale together by flowing and deflecting said raw and spent shale generally downwardly in a generally zigzag flow pattern over and upon at least six vertically spaced tiers of stationary triangular-shaped baffles with upwardly pointing apexes in an elongated deflector section of said static mixer retort having a greater diameter than and positioned substantially below said free-fall section, such that alternate tiers are spaced substantially parallel to each



other and substantially perpendicular to adjacent tiers as viewed in top plan view, said tiers extending laterally across said static mixer and including two inlet tiers and at least four other tiers positioned below said inlet tiers, said other tiers having similarly sized triangular-shaped baffles;

gravitatingly moving said shale substantially downwardly in a dilute-phase free-fall flow pattern in an upper portion of a surge bin positioned below said static mixer retort and in a dense-phase moving bed in the bottom portion of said bin at said retorting temperature for a sufficient time to substantially completely retort said raw oil shale so as to liberate hydrocarbons therefrom leaving retorted shale;

substantially combusting and recycling said retorted shale for use as said spent shale; and

separating at least one fraction of shale oil from said hydrocarbons.

4,597,853

PITCH AS A RAW MATERIAL FOR MAKING CARBON FIBERS AND PROCESS FOR PRODUCING THE SAME

Kunihiko Moriya, Tokyo; Kazuhito Tate, Kanagawa; Goro Muroga, Tokyo, and Kazuhiro Yanagida, Kanagawa, all of Japan, assignors to Mitsubishi Oil Co., Ltd., Tokyo, Japan

Filed Feb. 23, 1983, Ser. No. 468,910

Claims priority, application Japan, Feb. 23, 1982, 57-26740; Nov. 4, 1982, 57-192384

Int. Cl.⁴ C10C *3/00, 3/02;* D01F *9/12*

U.S. Cl. 208—22 **17 Claims**

1. A process for producing a pitch used as a raw material for carbon fibers, the pitch having a quinoline insoluble content of 7 to 18% by weight and a toluene insoluble content of 70 to 90% by weight and a n-heptane soluble content of 1.0% by weight or less, which comprises carrying out thermal modification of a petroleum heavy residual oil having a boiling point of 400° C. or more (atmospheric pressure) and a sulfur content of 1.5% by weight or less by heating the same at a temperature

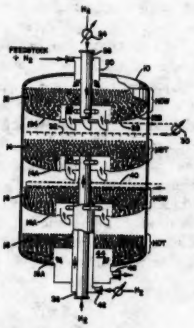
of 380° to 450° C. for 1 to 30 hours under atmospheric pressure so as to obtain a thermally modified oil in a yield of the thermally modified oil of 80% by weight or more, separating and removing insoluble substances undissolved in the thermally modified oil at a temperature of 200° to 380° C. from the thermally modified oil by the action of gravity or centrifugal force with heating at a temperature of from 200° to 380° C., and removing a low boiling point fraction having a boiling point of 400° C. or less by vacuum distillation at a pressure of 1.0 Torr or less.

4,597,854

MULTI-BED HYDRODEWAXING PROCESS

Joe E. Penick, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 17, 1985, Ser. No. 755,767
Int. Cl.[4] C10G *13/02, 23/02*
U.S. Cl. 208—58 **12 Claims**



1. A continuous cascading multi-bed process for catalytic hydrodewaxing of waxy, heavy hydrocarbon fraction feedstock comprising the conversion steps of

partially dewaxing the feedstock by contacting the feedstock at elevated temperature with a first catalyst bed comprising a ZSM-5 type crystalline zeolite in the presence of hydrogen;

subsequently contacting the partially dewaxed effluent from the first bed with at least one separate hydrogenation catalyst bed under hydrotreating conditions to saturate olefinic reaction products of the dewaxing step;

further catalytically dewaxing the hydrotreated feedstock in contact with ZSM-5 type catalyst in at least one additional catalytic dewaxing step; and

further hydrogenating the dewaxed feedstock in an additional hydrotreating step.

4,597,855

UPGRADING OF RESIDUAL OILS USING A SELENIUM CATALYST WHEREIN SULFUR AND METALLIC IMPURITIES ARE REDUCED

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 21, 1985, Ser. No. 747,509
Int. Cl.[4] C10G *45/04, 69/04*
U.S. Cl. 208—61 **17 Claims**

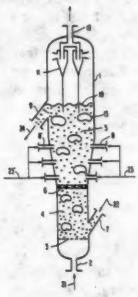
1. A process for upgrading a heavy hydrocarbon containing feed stream comprising the step of intimately contacting a substantially liquid hydrocarbon containing feed stream, which comprises from about 0.1 to about 40 weight-% of Ramsbottom carbon residue, from about 10 to about 1000 ppm vanadium and from about 5 to about 500 ppm nickel, with a free hydrogen containing gas and at least one selenium compound selected from the group consisting of selenium dioxide, selenous acid, ammonium selenites, sodium selenites, potassium selenites, selenium trioxide, selenic acid, ammonium selenates, sodium selenates, potassium selenates, adducts of SeO_3 and H_2SeO_4, selenium sulfides, selenium sulfate, dialkyl selenoxides and diaryl selenoxides, under such contacting conditions as will result in a liquid hydrocarbon containing stream having increased API[60] gravity and reduced levels of Ramsbottom carbon residue, vanadium and nickel, wherein at least a portion of each of the vanadium and nickel contained in said feed stream is converted to a precipitate, which is dispersed in said liquid hydrocarbon containing stream having increased API[60] gravity and reduced levels of Ramsbottom carbon residue, vanadium and nickel.

4,597,856

PROCESS FOR FLUIDIZED CATALYTIC CRACKING OF HEAVY OILS AND PRODUCTION OF HYDROGEN

Susumu Yoshioka, Ibaraki; Nobuo Matsuo, Hiroshima; Nobuyasu Meguri, Hiroshima; Tadashi Murakami, Kanagawa; Yasushi Ishibashi; Kenichi Matsuda, both of Okayama; Teruo Suzuka; Satoshi Fukase, both of Saitama, and Hidetaka Ohse, Tokyo, all of Japan, assignors to Processing Research Association of Residual Oil, Tokyo, Japan

Filed Oct. 17, 1984, Ser. No. 661,750
Claims priority, application Japan, Oct. 17, 1983, 58-192342
Int. Cl.[4] C10G *47/02*
U.S. Cl. 208—112 **7 Claims**



5. A process for fluidized catalytic cracking of heavy oils and production of hydrogen comprising contacting steam and heavy oils with fluidized catalyst particles containing reduced iron at high temperatures in a fluidized bed, said fluidized bed having a lower zone, an upper zone and a means for retarding mixing of fluidized particles between said lower zone and said upper zone,

wherein in a first step said catalyst particles containing reduced iron are first contacted with steam to form hydrogen in said lower zone;

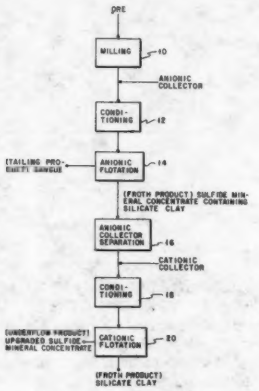
said catalyst particles are then passed into said upper zone above said means for retarding mixing; and said heavy oils are cracked in said upper zone;

and in a second step said catalyst particles are withdrawn from said upper zone and regenerated and the regenerated catalyst is recycled to said lower zone.

4,597,857
PROCESS FOR PRODUCING AN UPGRADED SULFIDE MINERAL CONCENTRATE FROM AN ORE CONTAINING SULFIDE MINERAL AND SILICATE CLAY

Daniel A. Norrgran, and William B. Davis, both of Tucson, Ariz., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 8, 1985, Ser. No. 721,022
Int. Cl.[4] B03D 1/02
U.S. Cl. 209—166 16 Claims

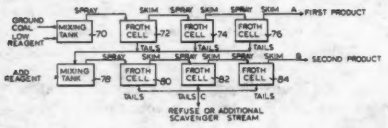


1. In a process for separating metal sulfide minerals from an ore containing said metal sulfide minerals and silicate clay by finely dividing said ore and subjecting said finely divided ore to anionic froth flotation using a suitable anionic collector to produce as a floated product a metal sulfide mineral concentrate containing a least a major portion of said metal sulfide minerals in said ore and silicate clay and a tailing product containing at least a major portion of the gangues of said ore, an improvement comprising: separating said anionic collector from said metal sulfide mineral concentrate and thereafter subjecting said metal sulfide mineral concentrate to cationic froth flotation using a suitable cationic collector to selectively float and separate at least a major portion of said silicate clay to produce as a residual product an upgraded metal sulfide mineral concentrate.

4,597,858
MULTISTREAM, MULTIPRODUCT BENEFICIATION ARRANGEMENT

Lester E. Burgess, Swarthmore; Phillip E. McGarry, Palmerton, and David E. Herman, Jim Thorpe, all of Pa., assignors to Sohio Alternate Energy Development Co., Cleveland, Ohio

Filed Sep. 14, 1984, Ser. No. 650,962
Int. Cl.[4] B03D 1/02
U.S. Cl. 209—166 5 Claims



1. A multiple stream, multiple product method for froth flotation separation of the components of an input slurry having particulate coal therein, said method comprising:

(a) in a first forward product stream, mixing a first quantity of chemical reagents with the particulate coal slurry, said chemical reagents comprising a monomer, a catalyst and a fluid hydrocarbon, spraying the particulate coal slurry with said chemical reagents mixed therein onto the surface of a liquid to create a floating froth phase on the liquid surface having a first quantity of the particulate coal therein, and allowing the remainder of the particulate coal slurry to separate from the froth phase by sinking in the liquid, and separating the froth phase as a first product; and

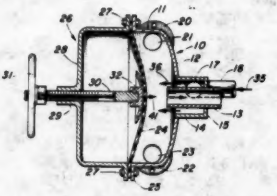
(b) in a second scavenger product stream, mixing an additional quantity of said chemical reagents with said remainder of the separated particulate coal slurry, spraying said remainder particulate coal slurry with the additional chemical reagents onto the surface of a liquid to create a floating froth phase on the liquid surface having a second quantity of the particulate coal therein, and allowing the remainder of the particulate coal slurry to separate from the froth phase by sinking in the liquid, and separating the second froth phase as a second product, whereby first and second separate product streams are separated from the input slurry,

wherein said fluid hydrocarbon in said first quantity of chemical reagents mixed with said forward product stream is restricted to a quantity which yields a lower recovery of said first product than said second product but which yields a first product which is cleaner than said second product and wherein said additional quantity of said chemical reagents mixed with said second scavenger product stream contains a sufficient quantity of fluid hydrocarbon to yield a higher recovery of said second product than first product and sufficient to yield a less clean second product than said first product but a cleaner second product than the particulate coal in said input slurry.

4,597,859
ADJUSTABLE VORTEX CLASSIFIER

Jeffrey L. Beck, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Oct. 15, 1984, Ser. No. 660,823
Int. Cl.[4] B04C 7/00; B01D 21/26
U.S. Cl. 209—211 13 Claims



11. A method for the classification of a slurry containing various size particles mixed in a fluid into a first stream containing fines and a second stream containing the remainder of the particles, by injecting said slurry axially into a cylindrical volume, injecting a fluid tangentially into said cylindrical volume, removing said second stream tangentially from said cylindrical volume, and removing said first stream axially from said cylindrical volume, and said method further comprising varying the classification of particle size between said first and second stream by changing the axial length of said cylindrical volume until said desired particle size distribution is achieved.

4,597,860

COIL ARRANGEMENT FOR A MAGNETIC SEPARATOR HAVING A STRONG FIELD

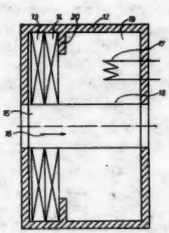
Karl-Heinz Kukuck, Ennigerloh, and Werner Baran, Essen, both of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Beckum, Fed. Rep. of Germany

Filed May 6, 1985, Ser. No. 730,950

Claims priority, application Fed. Rep. of Germany, May 18, 1984, 3418580

Int. Cl.[4] B03C *1/02*

U.S. Cl. 209—223 A 9 Claims



1. In a magnetic separator having an annular housing formed of weak magnetic material and through which extends a channel having an inlet and an outlet, the improvement comprising at least one magnetic coil encircling said channel adjacent the inlet thereof, and a magnetic shunt between the inlet and the outlet of said channel, that portion of said channel between said outlet and said shunt being free of magnetic coils.

4,597,861

SPIRAL SEPARATOR

Douglas C. Wright, Terranora, Australia, assignor to Mineral Deposits Limited, Queensland, Australia

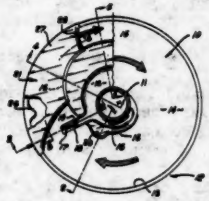
PCT No. PCT/AU84/00058, § 371 Date Dec. 7, 1984, § 102(e) Date Dec. 7, 1984, PCT Pub. No. WO84/04058, PCT Pub. Date Oct. 25, 1984

PCT Filed Apr. 12, 1984, Ser. No. 684,922

Claims priority, application Australia, Apr. 13, 1983, PF8850

Int. Cl.[4] B03B *5/52*

U.S. Cl. 209—459 13 Claims



1. A spiral separator for an aqueous slurry separation of varying specific gravity or sizes of a concentrate of said slurry from a remainder of said slurry in which a band of said remainder partially overlies a concentrate band having a helical trough including an inner wall and an outer wall connected by a floor and having at least one take-off opening for a concentrate species separated from a remainder of the slurry, said separator including deflection means arranged upstream of said take-off opening for diverting said band of the remainder in an outward direction relative to the concentrate band.

4,597,862

FILTER PRESS PLATE SEPARATION DEVICES

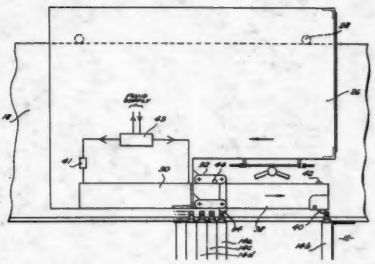
Alan E. Davis, Stoke-on-Trent, England, assignor to Edwards & Jones Limited, Stoke-on-Trent, England

Filed Mar. 9, 1984, Ser. No. 587,991

Claims priority, application United Kingdom, Mar. 11, 1983, 8306809

Int. Cl.[4] B01D *25/34, 25/22*

U.S. Cl. 210—106 3 Claims



1. In a multiplate filter press having a stationary frame which extends along the longitudinal axis of a pack of filter plates mounted thereon and a filter plate separating device, wherein the improvement comprises:

said filter plate separating device including a carriage being movably mounted to said frame for movement along said stationary frame in the direction of the longitudinal axis of the pack of filter plates,

a latch carried by the carriage for engaging a filter plate adjacent to the filter plate to be separated from the pack,

a pawl for engaging the filter plate to be separated from the pack, and

separating means being movably mounted on the carriage, the pawl being mounted on the separating means, and the separating means including means for moving it with respect to the carriage for moving the pawl away from the latch and for separating the filter plate to be separated from the pack.

4,597,863

HYDROCARBON RECOVERY SYSTEM

Theodore R. Rymal, Jr., Dickinson, Tex., assignor to Robert Dow, a part interest

Continuation of Ser. No. 308,932, Oct. 5, 1981, abandoned. This application Mar. 28, 1984, Ser. No. 594,280

The portion of the term of this patent subsequent to Jan. 8, 2002, has been disclaimed.

Int. Cl.[4] E02B *15/04;* B01D *17/02*

U.S. Cl. 210—117 19 Claims

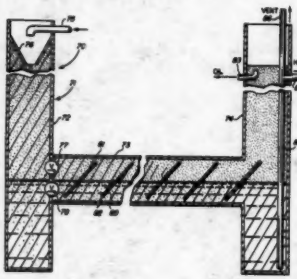
1. A skimming device for collecting hydrocarbons from the surface of a body of water, comprising:

a floating hull having a power source and a propellor connected together, said hull having boat means for operating the hull in a skimming mode;

said boat means including skimming means for skimming the surface of the water for collecting a mixture of hydrocarbons and water from the surface of the body of water, said skimming means including, when said boat means is operating in the skimming mode, at least one tunnel passing through said bottom portion of said hull and positioned for said propellor to draw water therethrough, whereby the vessel propellor is used to improve the removal of hydrocarbons from the surface of a body of water; and

separating means for separating hydrocarbons from skimmed water collected by said skimming means, said separating means including

a housing forming a pair of tanks connected by a passageway arranged between the top and bottom of said tanks;
an oil/water mixture inlet in one tank of said housing, check valve means between said one tank and said passageway between said tanks to prevent said oil/water mixture from flowing back to said one tank from said passageway;



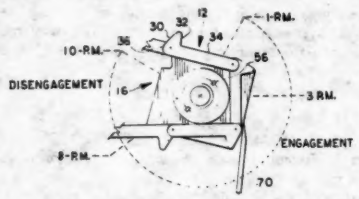
a plurality of baffles mounted at an angle with a space above and below each said baffle in said passageway between said tanks to permit fluid to flow about both the upper and lower ends of said baffles and therebetween and aid in separating oil from the water;
an oil outlet from said other tank, and
a water outlet from said other tank.

4,597,864

WASTE MATERIALS FILTERING APPARATUS

Bruce O. Wiesemann, 7027 Sunset Dr. South, South Pasadena, Fla. 33707

Filed May 28, 1985, Ser. No. 737,886
Int. Cl.[4] B01D *33/32*
U.S. Cl. 210—160 **14 Claims**



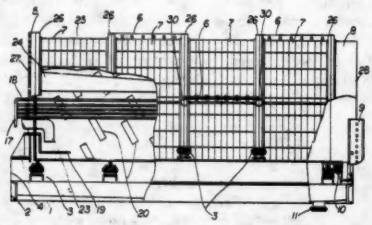
1. An apparatus that removes from a stream of water items of waste materials having dimensions greater than a preselected minimum size, comprising:
a screen assembly;
said screen assembly formed by a plurality of link members;
said link members connected in end to end relation to one another to form a continuous loop means;
a plurality of said loop means disposed in laterally spaced relation to one another to form said screen assembly;
each of said loop means positioned in lateral registration with at least one contiguous loop means so that said screen assembly includes a plurality of rows of laterally spaced and laterally aligned link members that define laterally disposed spaces therebetween through which spaces water and small debris may flow freely;
the lower end of said screen assembly being immersed in said stream of water and the upper end of said screen assembly being disposed out of said stream;
a motor for rotating said screen assembly;
said link members having a generally "L"-shaped configuration and being operable to engage said items and lift them out of said stream of water attendant rotation of said screen assembly by said motor;
a plurality of sprocket segments positioned interiorly of said loop means formed by said screen assembly and said sprocket segments disposed in laterally spaced relation to one another and having a fixed, common axis of rotation normal to the direction of flow of said stream of water;
said plurality of sprocket segments being equal in number to the number of spaces defined by a single row of said laterally spaced link members;
said sprocket segments fixed intermediate said link members, in the spaces defined therebetween, at the upper, nonimmersed end of said screen assembly and said sprocket segments being rotated by said motor;
and said segments specifically configured and dimensioned to provide full protrusion of said segments through the spaces between said link members which protrusion separates said items from said link members attendant rotation of said screen assembly.

4,597,865

ROTARY LIQUID SEPARATION UNIT

Arthur J. Hunt, and Arthur J. Hunt, Jr., both of 400 Holly St., P.O. Box 1821, Ormond Beach, Fla. 32074

Filed Jan. 11, 1985, Ser. No. 691,182
Int. Cl.[4] B01D *33/10*
U.S. Cl. 210—179 **3 Claims**



1. An apparatus for removing liquids from liquid-bearing materials comprised of
a horizontal cylinder resting on roller supports and rotatable by means of an electrically-driven motor and sprocket chain attached to a feed end of said cylinder;
a box or tray located at the bottom of the feed end near the circumference of the cylinder which catches the liquid-bearing materials that go into the cylinder and discharges said materials onto the floor at the beginning of the cylinder as it is rotating thereby preventing shearing of said materials;
removable and variable bar screens attached to the inside of the cylinder;
removable flights or blades connected to and extending from the inside of the cylinder, said flights slanted toward the feed end and spaced at desired intervals throughout so as to push the solid material toward a discharge end of the cylinder;
a dam which abuts the discharge end of the cylinder and is adjustable upward or downward to control the material processing time;
a four-sided supporting weldment having roller supports on the sides and underneath thereof onto which the cylinder rests with a drain pan in the bottom thereof, the floor of which slopes toward a drain outlet near the back of the drain pan;
a water flush system in the interior of the cylinder consisting of a pipe extending along the inside wall of the cylinder and spray nozzles pointing outwardly toward the wall of the cylinder through which water is forced to clean the bar screens on the interior of the cylinder; and
a high pressure air spray system on the exterior of the cylin-

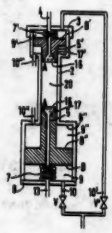
der consisting of a pipe extending along the outside wall of the cylinder with spray nozzles pointing inwardly toward the wall of the cylinder from which air is forced through the screens to remove the particles.

4,597,866

CHROMATOGRAPHY APPARATUS

Francois Couillard, Serres Castet, France, assignor to Groupe Industriel de Realisations et Applications, Morlaas, France

Filed Nov. 27, 1984, Ser. No. 675,337
Claims priority, application France, Dec. 2, 1983, 83 19315; Nov. 22, 1984, 84 17796
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—198.2 12 Claims



1. A chromatographic column assembly comprising:
a tubular column having first and second sealed ends,
a sealed piston slidable within the column for compressing a filling placed in a tubular chamber defined between the piston and said first sealed end of the tubular column,
communicating means provided in the piston and in said first sealed end for ensuring a circulation of fluid to be chromatographed through the filling,
a sealed enclosure defined between said piston and said second sealed end and independent of the circulation of the fluid to be chromatographed, and which contains a pressurized fluid which displaces said piston in the direction of said filling, and a flexible conduit ensuring the independent circulation of the fluid to be chromatographed and crossing through the second sealed end of said column, the enclosure containing the pressurized fluid and said piston.

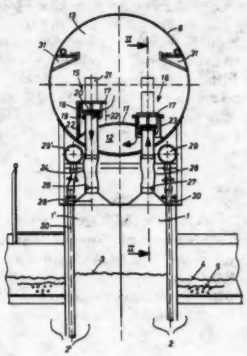
4,597,867

AIR-CONTROLLED SETTLING APPARATUS

Otto Heinemann, Ennigerloh; Heinz-Dieter Baldus, Ahlen; Armin Supp, Hamm; Hans Nanz, Ennigerloh; Helmut Thieme, Nottuln, and Heinz Rasch, Oelde, all of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Beckum, Fed. Rep. of Germany

Filed Feb. 25, 1985, Ser. No. 705,355
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1984, 3408378
Int. Cl.[4] B01D *21/24*
U.S. Cl. 210—218 11 Claims

1. Air-controlled settling apparatus comprising means forming a plurality of settling compartments each of which has a chamber having an air inlet and an air outlet; an air vessel; an air supply duct in said vessel; an exhaust air duct in said vessel; an air inlet valve for each of said chambers; an air outlet valve for each of said chambers; means mounting all of said valves in said vessel; first duct means establishing communication between each of said inlet valves and the associated chamber; second duct means establishing communication between each of said outlet valves and the associated chamber; and closure



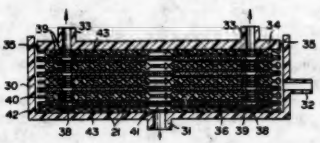
means for said vessel movable between open and closed positions for providing access to said valves.

4,597,868

BODY FLUID FILTER DEVICE

Masaharu Watanabe, Kawasaki, Japan, assignor to Terumo Corporation, Tokyo, Japan

Continuation of Ser. No. 285,058, Jul. 20, 1981, abandoned. This application May 7, 1984, Ser. No. 608,273
Claims priority, application Japan, Jul. 24, 1980, 55-101558
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—232 23 Claims



1. A plasma separator comprising in combination:
a blood filter membrane having an average pore diameter between about 0.1 and 1.0 micron;
a blood flow path regulation plate disposed adjacent to one surface of said filter membrane and provided on at least one surface thereof with a plurality of flexible, elastic, and discontinuous protuberances distributed thereover at fixed intervals, said protuberances having a height of from 50 to 500 microns and contacting the filter membrane to provide a gap between the filter membrane and the flow path regulating plate;
said blood flow path regulation plate and said protuberances having a Young's modulus of elasticity in the range of from 1.0×10^6 to 2.0×10^{10} dynes/cm^2;
a filtrate flow path forming plate disposed on the other surface of said filter membrane;
a seal member adapted to prevent the blood and the filtrate from mingling with each other;
a filter device case provided with a blood inlet, a filtration residual blood outlet and a filtrate outlet and formed of at least one upper and one lower plate-like member; and
pressure means adapted to adjustably press said upper and lower plate-like members of said filter device case relatively toward each other;
said blood flow path regulation plate, said blood filter membrane, and said filtrate flow path forming plate being piled up one above the other in the order stated through the

medium of said seal member, and being encased in situ within said filter device case between said upper and lower plate-like members which are pressed by said pressure means, to thereby provide a first blood flow path for enabling blood flowing in through the blood inlet to advance through the gap formed between the filter membrane and the flow path regulating plate and, after separation of filtrate by the filter membrane, to be led to the filtration residual blood outlet, and a second blood flow path for enabling the filtrate produced by the filter membrane to be advanced through the filtrate flow path forming plate to the filtrate outlet.

4,597,869

PLATE PACK FOR AN INCLINED PLATE SEPARATOR

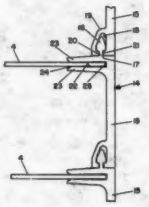
Sven Hakansson, Nynashamn, Sweden, assignor to Axel Johnson Engineering AB, Nynashamn, Sweden

Filed Jan. 22, 1985, Ser. No. 693,274

Claims priority, application Sweden, Jan. 23, 1984, 8400333

Int. Cl.[4] B01D *21/02*

U.S. Cl. 210—232 **8 Claims**



1. A plate pack for an inclined plate separator comprising a plurality of spaced-apart substantially parallel plates inclined to the horizontal and forming a plurality of separation passages therebetween; a plurality of plate support members covering the sides of the separation passages; the plate support members having substantially the same inclination as the plates and being joined together by fastening means, formed along the inclined edges of the support members, so as to form the opposite side walls of the plate pack; the plate support members being provided with at least one slot extending at the inclination of the plates, the slot having elastically resilient side walls and having in the depth direction of the slot at least one narrow portion with a separation between the side wall surfaces which is less than the plate thickness.

4,597,870

FILTER DEVICE FOR A SCREW EXTRUDER

Friedrich Lambertus, Stuttgart, Fed. Rep. of Germany, assignor to Werner & Pfleiderer, Stuttgart, Fed. Rep. of Germany

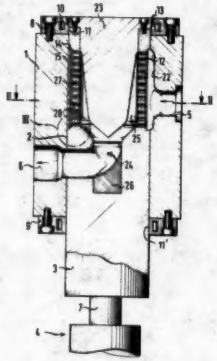
Filed May 22, 1985, Ser. No. 736,869

Claims priority, application Fed. Rep. of Germany, May 26, 1984, 3419822

Int. Cl.[4] B01D *35/12*

U.S. Cl. 210—341 **11 Claims**

1. A filter device for a screw extruder for molten plastic comprising a filter housing having an inlet for molten plastic and an outlet for filtered molten plastic, a cylindrical slide supported for axial displacement in said housing, means for axially displacing said slide between operative and inoperative positions, said slide having a passage therein, and in said operative position, said passage connecting said inlet to said outlet for flow of molten plastic from said inlet to said outlet, said slide having an outer cylindrical periphery with an annular recess therein forming a portion of a melt channel communicating with said inlet in said operative position of the slide, and an annular screen member mounted in said annular recess for filtering molten plastic in its flow from said inlet to said passage, said passage having a portion which extends longitudinally in the direction of displacement of the slide and which in said operative position coextends with said melt channel, said housing having an annular groove communicating with said annular recess to cooperate therewith to form said melt channel, said annular groove having a length at least as great as that of said recess, said melt channel having a varying width over its annular extent, said width being a maximum in the region of said inlet.



4,597,871

APPARATUS FOR REMOVING FOREIGN MATTERS

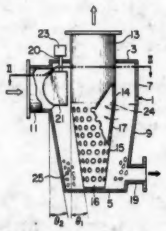
Isao Okouchi; Kenkichi Izumi; Sankichi Takahashi; Yasuteru Mukai, and Akira Tomida, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 150,002, May 15, 1980, abandoned. This application May 29, 1984, Ser. No. 614,666

Claims priority, application Japan, May 25, 1979, 54-63831

Int. Cl.[4] B01D *21/26*

U.S. Cl. 210—456 **3 Claims**



1. Apparatus for removing foreign matters such as marine organisms in a liquid stream, the apparatus comprising:

a closed housing having a first end of a larger diameter, a second end of a smaller diameter, and a side wall member with an inner wall of a conical shape gradually decreasing in diameter from around said first end to said second end;

inlet means disposed near the first end of said housing and extending radially therefrom for introducing the liquid stream into said housing in a radial direction with respect to a center axis of said housing;

deflector means disposed at said inlet means for swirling the liquid stream in said housing;

outlet means disposed coaxially with said housing and located at the first end thereof for discharging the liquid stream from said housing after filtration;

filter means coaxially disposed in said housing and mounted on an end plate of said first end of said housing, said filter

means having a conical configuration with a diameter decreasing gradually in a direction toward the second end of said housing at an inclination angle of θ_1, said filter means being arranged in said housing so that an annular liquid passage is defined between the inner wall of said housing and an outer surface of said filter means, said annular liquid passage extending axially from said inlet means to said second end of said housing and being gradually reduced in a cross-sectional area taken along a plane perpendicular to the longitudinal axis of said housing towards the second end so that the liquid stream with the foreign matter can be moved toward the second end of the housing while swirling around said filter means;

means for adjusting the deflector means so as to change a swirling direction of the liquid stream; and

extracting means radially provided in said side wall member of said housing near the second end of said housing and communicating with said annular passage for extracting the foreign matter along with part of the liquid.

4,597,872

METHOD FOR ANAEROBIC WASTEWATER TREATMENT

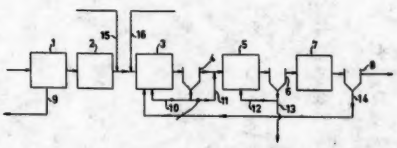
Per-Erik Andersson; Göran E. Annergren, both of Sundsvall; Hans E. Höglund, Matfors, and Per V. Peterson, Sundsvall, all of Sweden, assignors to Purac Aktiebolag, Lund, Sweden

Filed Aug. 6, 1984, Ser. No. 637,820

Claims priority, application Sweden, Aug. 10, 1983, 8304354

Int. Cl.[4] C02F *11/04, 3/28*

U.S. Cl. 210—605 **10 Claims**



1. A method for treating carbohydrate containing wastewater from the manufacture of mechanical or chemi-mechanical cellulose pulp, the wastewater including long fibres, fibrils and fibre fragments comprising the following sequential steps of:

(i) removing the long fibres to a substantial extent from the wastewater such that 100–500 mg/liter of the fibrils and fibre fragments remain;

(ii) anaerobically carrying out hydrolysis and acid fermentation of said wastewater until at least 70% of the carbohydrates in the wastewater are degraded to low molecular weight organic acids and an excess of sludge is formed;

(iii) transferring said wastewater, said low molecular weight organic acids and said excess of sludge to a separate methane fermentation step; and

(iv) anaerobically carrying out methane fermentation of the low molecular weight organic acids and the excess of sludge.

4,597,873

PROCESS OF MASS TRANSFER AND MATERIAL SEPARATION USING A MICROCHANNEL PLATE

Bipin C. Almaula, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 509,840, Jun. 30, 1983, abandoned. This application Feb. 21, 1985, Ser. No. 703,860

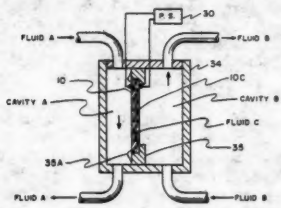
Int. Cl.[4] B01D *13/00;* **B01J** *35/04;* **C01F** *11/28*

U.S. Cl. 210—649 **3 Claims**

1. A process of mass transfer between cross-flowing fluids in two cavities in a fluid containment housing comprising the steps of:

placing at least one microchannel plate mounted on a plate holder between said two fluid cavities, said at least one microchannel plate having a plurality of channels wherein the diameter of each channel is about 4 to 100 microns, said plurality of channels having porous material contained therein, said porous material being impregnated with bromo benzene fluid;

flowing chlorine in a fluid base through one of said two fluid cavities; and



passing calcium carbonate dissolved in water through the other of said two fluid cavities whereby said chlorine migrates through said porous material within the channels by dissolving within said bromo benzene fluid and said calcium carbonate reacts with the chlorine migrating through said porous material resulting in the formation of calcium chloride and the removal of chlorine from said fluid base.

4,597,874

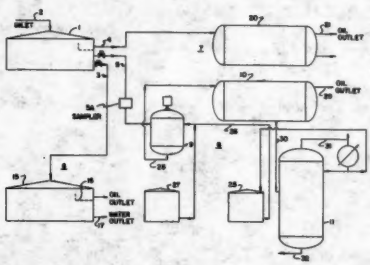
TREATMENT OF OIL WELL PRODUCTION

Alex W. Francis, Jr. deceased, late of Tulsa, Okla. (by First National Bank and Trust Company, executor), assignor to Combustion Engineering, Inc., Windsor, Conn.

Continuation-in-part of Ser. No. 574,312, Jan. 27, 1984, Pat. No. 4,555,332. This application Mar. 7, 1985, Ser. No. 709,146

Int. Cl.[4] B01D *17/025*

U.S. Cl. 210—708 **3 Claims**



1. Producing a well stream of oil and water by injecting a saline-tolerant surfactant into the formation which forms an emulsion with a portion of the oil and water,

separating and concentrating the surfactant-rich emulsion from the well stream,

analyzing the surfactant-rich emulsion to determine the optimum ratio of cosolvent and fresh water to be used to break the bond of the oil and dissolve the surfactant into the water,

forming a solution of cosolvent and fresh water in accordance with the analysis,

mixing the solution of cosolvent and fresh water with the saline-tolerant surfactant-rich emulsion of the well stream to break the bond of the oil and dissolve the surfactant into the water,

separating the water and cosolvent and surfactant from the oil of the surfactant emulsion,

vaporizing the cosolvent from the surfactant and water for recovery and reuse,

and recycling the surfactant and water for reuse.

4,597,875

PRECIPITATIVE REMOVAL OF NITROCRESOLS FROM DINITROTOLUENE WASTE STREAMS

Richard V. C. Carr, Allentown; John E. Sawicki, Breinigsville, and Bernard A. Toseland, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 7, 1985, Ser. No. 731,424

Int. Cl.[4] C02F *1/52, 1/66*

U.S. Cl. 210—710 7 Claims

1. In a process for removing nitrophenolic material from the crude nitroaromatic product produced in the nitration of aromatic compounds selected from the group consisting of dinitrobenzene and dinitrotoluene by the mixed acid technique, the improvement which resides in

(a) contacting the resultant crude nitroaromatic product with an alkaline material to convert nitrophenolic material therein to a water soluble salt, and thereby form a purified nitroaromatic organic product and an aqueous by-product phase containing the alkali metal salt of nitrophenolic materials.

(b) separating the aqueous phase from the organic phase,

(c) recycling a portion of the aqueous phase for contact with additional crude nitroaromatic product, and increasing the concentration of water soluble salt of nitrophenolic material in said aqueous phase to a level from about 0.7 to 1.4% by weight,

(d) contacting the aqueous phase containing from 0.7 to 1.4% by weight of water soluble nitrophenolic material with an acid, said acid being added in sufficient proportion to convert the water soluble nitrophenolic material to water insoluble nitrophenolic organic phase,

(e) separating the aqueous phase from the water insoluble nitrophenolic organic phase; and then

(f) incinerating the nitrophenolic organic phase.

4,597,876

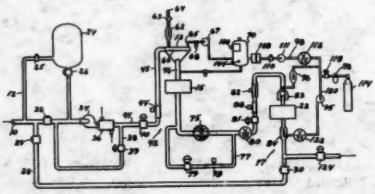
REGASIFYING PASTEURIZATION SYSTEM

Mark N. Hall, College Place, Wash., assignor to Hallsonic Corporation, College Place, Wash.

Filed Aug. 11, 1983, Ser. No. 522,637

Int. Cl.[4] C02F *1/20, 1/36*

U.S. Cl. 210—748 19 Claims



1. A method for treating liquids containing dissolved gases and microorganisms so that at least portions of the microorganisms are destroyed and at least portions of said dissolved gases are present in resulting treated liquid in order to maintain distinctive flavors associated therewith, comprising:

degassing a liquid to remove approximately all of the dissolved gases by subjecting the liquid to a static degasification pressure which is below atmospheric pressure and above the vapor pressure of the liquid in its then-existing state, and by creating degassing compressional waves within the liquid to hasten removal of dissolved gases therefrom;

disintegrating microorganisms contained in the liquid degassed in the previous step using vaporously cavitating compressional waves;

pressurizing the liquid after the degassing step above;

regasifying the liquid after the liquid has been subjected to said disintegrating step by injecting small bubbles of gas into the liquid, and creating compressional waves in the liquid injected with bubbles of gas at least a portion of which is gas previously dissolved within and removed from the liquid during the degassing step, to thereby dissolve the bubbles of gas into the liquid.

4,597,877

PROCESS AND EQUIPMENT FOR WATER TREATMENT

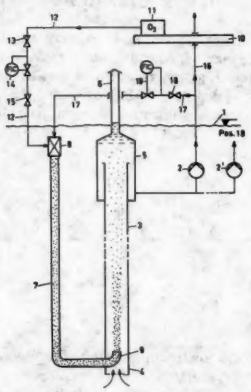
Franco Gaia, Caslano, Switzerland, assignor to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland

Filed Jan. 30, 1985, Ser. No. 696,489

Claims priority, application Switzerland, Feb. 23, 1984, 885/84

Int. Cl.[4] C02F *1/78*

U.S. Cl. 210—750 9 Claims



1. A process for treating water with a gaseous substance, comprising the steps of:

using a mixer immersed in a body of water to mix water with a gaseous substance to form a mixture of water and said gaseous substance;

causing said mixture including bubbles of said gaseous substance to flow downward through bubble column downflow reactor means extending substantially vertically and immersed in a body of water, said downward flow being controlled to be at a velocity greater than 0.3 m/second and greater than a rate of rising of said bubbles, whereby said bubbles are compressed and mass transfer of said gaseous substance to said water takes place;

introducing said mixture from a lower portion of said downflow reactor means to a lower portion of a riser having a sectional area greater than that of said reactor means, said riser extending substantially vertically and being immersed in said body of water, said lower portion of said riser permitting direct entry of said water from said body of water so that fresh water from said body of water may be drawn into said riser;

permitting said mixture to rise in said riser and mix with said water in said riser, whereby further mass transfer of said gaseous substance takes place;

separating residual gaseous substance from treated water of said mixture which has risen through said riser;

using a pump positioned below a surface of said body of water to pump said treated water to an intended use; and

recycling a portion of said pumped treated water to said mixer.

4,597,878

POLYPHENOLIC ACID ADDUCTS

Roy F. House, Houston, Tex., and Victor M. Granquist, Lafayette, La., assignors to Venture Innovations, Inc., Lafayette, La.

Filed Dec. 31, 1984, Ser. No. 688,077
Int. Cl.[4] C09K 7/06
U.S. Cl. 252—8.5 M 14 Claims

1. An adduct of a polyphenolic acid selected from the group consisting of humic acid, sulfonated humic acid, and mixtures thereof, and an amide mixture of a polyamide and an amido-amine containing one free amino group per molecule, wherein the weight ratio of said amide mixture to said polyphenolic acid is in the range from about 0.2 to 1 to about 1 to 1, and wherein said amide mixture is obtained by reacting under amidation conditions an acid containing from about 16 to about 30 carbon atoms per molecule selected from the group consisting of aliphatic carboxylic fatty acids, rosin acids, and mixtures thereof, and an amine mixture comprising aminoethylethanolamine, aminoethylpiperazine, and one or more linear polyethylenepolyamines containing at least 3 amino groups per molecule, said amine mixture having a weight ratio of said aminoethylethanolamine to said aminoethylpiperazine and said linear polyethylenepolyamine within the range from about 0.25 to 1 to about 3 to 1, wherein the amount of said acid is greater than the amount required to amidate (X-1) amino groups per amine molecule where X is the average number of amino groups per molecule in said amine mixture, and less than the amount required to amidate all of the amino groups.

11. An oil base drilling fluid comprising a major proportion of oil and a minor proportion but sufficient to decrease the fluid loss of said fluid of the polyphenolic acid adduct of claim 1.

4,597,879

MICELLAR SLUG FOR OIL RECOVERY

Hiroshi Morita, Chiba; Yasuyuki Kawada, Funabashi; Junichi Yamada, and Toshiyuki Ukigai, both of Chiba, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 458,360, Jan. 17, 1983, Pat. No. 4,555,351. This application Mar. 31, 1983, Ser. No. 480,768
Claims priority, application Japan, Jan. 28, 1982, 57-10858; Mar. 25, 1983, 58-48666
The portion of the term of this patent subsequent to Jul. 30, 2002, has been disclaimed.
Int. Cl.[4] E21B 43/22
U.S. Cl. 252—8.55 D 3 Claims

1. A micellar slug for use in the recovery of oil, said slug consisting essentially of about 2% to 90% by weight of a hydrocarbon, about 4% to 90% by weight of an aqueous medium containing about 1% to about 15% by weight of an inorganic salt, about 1% to 30% by weight of a surfactant, and about 0.1% to 20% by weight of a cosurfactant, said surfactant containing, as an essential component, an internal olefin sulfonate having 10 to 26 carbon atoms, a hydroxyalkane sulfonate content of not less than about 40% by weight and a disulfonate content of not more than 20% by weight and said internal olefin sulfonate being derived from the sulfonation of an internal olefin having the general formula:

$$R-CH=CH-R'$$

wherein R is a straight- or branched-chain alkyl group having 4 to 23 carbon atoms, R' is a straight- or branched-chain alkyl group having 1 to 12 carbon atoms provided that the total carbon atom numbers of R and R' is 8 to 24 and 50% by weight or more of the internal olefins is that having R' with 1 to 4 carbon atoms.

4,597,880

ONE-STEP PROCESS FOR PREPARATION OF OVERBASED CALCIUM SULFONATE GREASES AND THICKENED COMPOSITIONS

Theo I. Eliades, West Hill, Canada, assignor to Witco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 531,219, Sep. 9, 1983, abandoned. This application May 28, 1985, Ser. No. 738,242
Int. Cl.[4] C10M 105/22
U.S. Cl. 252—33.4 14 Claims

1. An improved 1-step process for preparing a thixotropic overbased calcium sulfonate complex in the form of a grease or thickened composition, which comprises forming a liquid mixture containing a liquid carrier material in the form of a volatile liquid hydrocarbon or a nonvolatile oil or a mixture thereof; a sulfonic acid having or including an aliphatic chain containing at least 12 carbon atoms and having a molecular weight in the range of about 300 to about 700; calcium oxide and/or calcium hydroxide; a member selected from the group of C_1–C_4 water-soluble aliphatic alcohols and water-soluble alkoxyalkanols; a water-soluble carboxylic acid; and water; agitating and heating said mixture to a temperature in the range of about 95° to about 200° F. and carbonating said mixture for a period of time to effect between about 80% and 100% of completion of carbonation until the reaction mixture is changed to a grease or a thickened composition containing colloidally dispersed particles of calcium carbonate in the form of calcite crystals.

4,597,881

PROCESS FOR PRODUCING A LITHIUM-SOAP GREASE

Akira Iseya; Takekatsu Kita, and Makoto Ikeda, all of Ichihara, Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 605,569, Apr. 30, 1984, abandoned. This application Aug. 26, 1985, Ser. No. 769,844
Claims priority, application Japan, May 10, 1983, 58-80112
Int. Cl.[4] C10M 113/08
U.S. Cl. 252—41 12 Claims

1. A process for producing a lithium-soap grease which comprises:

adding a hydroxy-fatty acid having from 12 to 24 carbon atoms, and a dicarboxylic acid having from 8 to 10 carbon atoms to a base oil (I) having an aniline point of from 110° to 130° C. at a temperature of less than 100° C. with stirring to prepare a uniform dispersion of said acids in the base oil (I);

adding lithium hydroxide to said uniform dispersion with stirring;

reacting said acids and lithium hydroxide and dehydrating by heating to a temperature of 195° to 210° C.;

cooling the reaction mixture to a temperature not higher than about 160° C. at a cooling rate of from about 20° to 80° C./hour; and

adding a base oil (II) having an aniline point of from 130° to 140° C. to the reaction mixture for a period of from 10 seconds to 30 minutes in an amount so that the weight ratio of the base oil (I) to the base oil (II) is from 30:70 to 60:40 and the resulting mixture of the base oils (I) and (II) has a dynamic viscosity as determined at 100° C. of from 5 to 50 centistokes and an aniline point of from 125° to 135° C. to produce said lithium-soap grease.

4,597,882

PROCESS FOR REGENERATING WASTE OILS OF SYNTHETIC LUBRICANTS CONTAINING FLUORINE ATOM

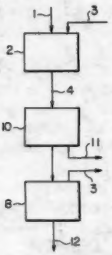
Toshihiro Nishimura, Kawasaki; Muneo Nakayama, Tokyo, and Akira Hashimoto, Yokohama, all of Japan, assignors to Tokyo Denshi Kagaku Co., Ltd., Japan

Filed May 31, 1984, Ser. No. 615,736

Claims priority, application Japan, Jun. 13, 1983, 58-104202; Mar. 19, 1984, 59-051151

Int. Cl.[4] C10M *107/38*

U.S. Cl. 252—51 13 Claims



1. A process for regenerating waste oils of fluorine atom containing synthetic lubricants comprising a polymer or an oligomer selected from the group consisting of perfluoropolyether, perfluoropolyphenylether and perfluoropolyether triazine, comprising:

(a) adding to said waste oils a fluorine containing solvent selected from the group consisting of trichloromonofluoromethane, tetrachlorodifluoroethane, trichlorotrifluoroethane, an azeotropic mixture of trichlorotrifluoroethane and methylene chloride, an azeotropic mixture of trichlorotrifluoroethane and ethanol, a mixture of trichlorotrifluoroethane and isopropanol, and dibromotetrafluoroethane, in sufficient amounts that at least 0.5 parts by weight of said fluoring containing solvent are added per one part by weight of said waste oils;

(b) mixing the solvent and waste oils to form a mixed solution to cause contaminants contained in said waste oils to float upwards and separate into an upper layer on the mixed solution formed from said waste oils and said solvent;

(c) removing said upper layer to separate said contaminants;

(d) adding a non-fluorine containing solvent to the mixed solution and separating the resultant mixture into two layers to transfer any remaining portion of the contaminants to the non-fluorine containing solvent in the upper layer, said non-fluorine containing solvent being selected from the group consisting of pentane, hexane, heptane, octane, ligroin, kerosene, naphths, cyclohexane, toluene, xylene, methylene chloride, carbon tetrachloride, ethylene chloride, trichloroethane, hexyl chloride, methanol, ethanol, n-propanol, isopropanol, butanol, amyl alcohol, hexanol, heptanol, isopropyl ether, butyl ether, furfural, acetone, acetyle acetone, cyclohexanone, methyl ethyl ketone, methyl butyl ketone, methyl isobutyl ketone, diethyl ketone, diisobutyl ketone, acetonyl acetone, diacetone alcohol, isophorone, methyl acetate, ethyl acetate, butyl acetate, ethylene glycol monomethyl ether, ethylene glycol monomethyl ether acetate, ethylene glycol monoethyl ether, and ethylene glycol monoethyl ether acetate, and being added in an amount of at least 0.2 parts by weight per one part by weight of the fluorine containing solvent; and

(e) recovering the fluorine containing synthetic lubricants from said mixed solution forming the lower layer.

4,597,883

COMPOSITION AND METHOD FOR MINIMIZING FROST DAMAGE TO PLANTS

Albin D. Lengyel, 2417 E. Indian School Rd., Phoenix, Ariz. 85064

Continuation-in-part of Ser. No. 667,528, Nov. 1, 1984, abandoned. This application May 14, 1985, Ser. No. 733,894

Int. Cl.[4] C09K *3/18;* A01G *13/00*

U.S. Cl. 252—70 16 Claims

8. A method for minimizing the frost damage to a plant comprising applying to the plant an aqueous solution containing in each gallon of water 0.1 to 2.0 pounds of sugar and 0.1 to 2.0 pounds of at least one potassium chemical selected from the group consisting of potassium sulfate and potassium nitrate.

9. The method of claim 8 wherein each gallon includes at least one of

(a) 0.01 to 0.5 pounds of at least one manganese chemical selected from the group consisting of manganese chelated with ethylene diamine tetra acetic acid, manganese chelated with lignin sulfonate, and water soluble manganese sulfates;

(b) 0.01 to 0.5 pounds of at least one iron chemical selected from the group consisting of iron chelated with ethylene diamine tetra acetic acid, iron chelated with lignin sulfonate, and water soluble ferric and ferrous sulfates; and,

(c) 0.01 to 1.5 pounds of a water soluble magnesium sulfate.

4,597,884

ICE AND SNOW MELT

Steve Greenwald, 18 Ann Cir., Richboro, Pa. 18954

Filed Oct. 2, 1984, Ser. No. 657,357

Int. Cl.[4] C09K *3/18*

U.S. Cl. 252—70 4 Claims

1. A non-corrosive solid ice melting composition consisting of prill urea particles and a liquid antifreeze composition, said antifreeze composition coating said urea particles.

4,597,885

ENCAPSULATED FOAMING BATH COMPOSITION

Ira R. Berry, Westfield; Dilip Shah, Parsippany, and Lionel Borkan, New Vernon, all of N.J., assignors to Pharmacaps, Inc., Elizabeth, N.J.

Filed Jan. 2, 1985, Ser. No. 688,748

Int. Cl.[4] C11D *17/08*

U.S. Cl. 252—93 10 Claims

1. A cosmetic unit dosage form comprising a soft gelatin capsule containing a substantially water-free, liquid blend consisting essentially of:

(a) from about 0.5% to about 10% of a fragrance;

(b) from about 30% to about 60% a foamable mixture of basic surfactants comprising a (diethanol)amine salt of a fatty alcohol (ethylenoxy)sulfate and a fatty acid (diethanol)-amide; and

(c) from about 30% to about 60% an amount of a foamable acidic surfactant comprising fatty alcohol(polyethylenoxy)acetic acid effective to render the liquid blend substantially non-reactive with said gelatin capsule while maintaining the foam-producing ability of the surfactants in aqueous media, said percentages being percentages by weight based on the total weight of the composition, said composition containing not more than 10% by weight of other components.

4,597,886

DISHWASHING COMPOSITIONS

Machiel Goedhart, Rozenburg; Franciscus H. Gortemaker, Mijnsheerenland; Hermanus C. Kemper, Brielle, and Hendrik S. Kielman, Maassluis, all of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Oct. 12, 1984, Ser. No. 660,606

Claims priority, application United Kingdom, Oct. 20, 1983, 8328075

Int. Cl.[4] C11D *3/395, 7/54, 17/00*

U.S. Cl. 252—95 2 Claims

1. A powdered enzymatic mechanical dishwashing composition with a reduced tendency to spot- and film-formation consisting essentially of:

(a) from 1–5% by weight of a nonionic detergent surfactant;

(b) from 10–90% by weight of an alkali salt selected from the group consisting of the organic and inorganic builder salts;

(c) from 0.001–10% by weight of an enzyme selected from the group consisting of amylases, proteases, lipases, cellulases and mixtures thereof;

(d) from 0.5–60% by weight of a layered clay, said clay being a synthetic hectorite; and

(e) a bleaching agent present in an effective amount to clean dishes;

said composition having a pH between 10 and 12 at 3 g/l in aqueous solution.

4,597,887

GERMICIDAL HARD SURFACE CLEANING COMPOSITION

Daniel Colodney, Somerset, and Divaker B. Kenkare, South Plainfield, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 21, 1984, Ser. No. 684,557

Int. Cl.[4] C11D *1/62*

U.S. Cl. 252—106 13 Claims

1. A clear, liquid, germicidal, hard surface cleaner consisting essentially of, by weight, a water-soluble, germicidal, quaternary ammonium salt having an alkyl group of 8 to 18 carbon atoms in its structure in an amount from the range of 2.5% to 6% which is effective to provide germicidal properties at a concentration of 1.5% by weight of said cleaner in water; 2% to 5% of a water-soluble ethyleneoxylated nonionic detergent; from 1% to 8% of cis/trans 2,6,6 trimethylbicyclo (3.1.1) heptane; from 1% to 8% of a nonaqueous, polar, organic solvent having water solubility at 25° C. of at least 20% by weight selected from the group consisting of C_1–C_4 alkyl ethers of ethylene glycol or diethylene glycol or mono-, di- or tripropylene glycol, from 2% to 6% of a water-soluble organic or inorganic alkaline builder salt; the weight of said nonionic detergent being not greater than the weight of said quaternary salt; and the balance primarily water.

4,597,888

CLEANER FOR STEEL CANS

Peter F. King, Farmington Hills, Mich., assignor to Parker Chemical Company, Madison Heights, Mich.

Filed Jun. 19, 1985, Ser. No. 746,430

Int. Cl.[4] C11D *3/075*

U.S. Cl. 252—135 23 Claims

1. An alkaline cleaner composition comprising:

(a) from about 0.5 to about 25 parts by weight of an alkali metal silicate;

(b) from about 0.1 to about 3.0 parts by weight of an alkali metal phosphate;

(c) from about 0.1 to about 3.0 parts by weight of a sequestering agent;

(d) from about 0.05 to about 1.5 parts by weight of an ethoxylated linear alcohol;

(e) from 0.05 to about 1.5 parts by weight of a chloride derivative of a nonionic surfactant selected from the group consisting of a polyethoxylated phenol, a polyethoxylated aliphatic alcohol and mixtures thereof.

4,597,889

HOMOGENEOUS LAUNDRY DETERGENT SLURRIES CONTAINING POLYMERIC ACRYLIC STABILIZERS

Charles E. Jones, Yardley, Pa., and Bette-Jean Brabant, Mercerville, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Aug. 30, 1984, Ser. No. 645,588

Int. Cl.[4] C11D *3/075, 3/37, 17/08*

U.S. Cl. 252—135 13 Claims

1. A stable, homogeneous aqueous detergent slurry comprising:

a. a sodium polyphosphate in amounts of from about 14 weight percent to about 30 weight percent,

b. sodium carboxymethylcellulose in amounts of from 0 weight percent to about 1 weight percent,

c. a compatible, inorganic alkali metal hydroxide or alkali metal salt in amounts of 0 weight percent to 5 weight percent, as a viscosity modifier, wherein said alkali metal salt is selected from the group consisting of sodium carbonate, potassium chloride, sodium chloride, potasium carbonate, tetrapotassium pyrophosphate, potassium tripolyphosphate, potassium carbonate, sodium sesquicarbonate, potassium sesquicarbonate, sodium borate, potassium borate, potassium sulfate, sodium sulfate, sodium orthophosphate and potassium orthophosphate,

d. soluble, nonionic surface-active agents in amounts totaling from about 13 weight percent to about 20 weight percent,

e. a high molecular weight polymer of an acrylic acid in stabilizing amounts of from about 0.4 weight percent to about 2 weight percent wherein said polymer has an equivalent weight of solids of about 123.5 to 150, is employed as an anionic aqueous emulsion having a solids content of about 20%, a pH of about 3, a viscosity of from about 50 to 200 cps which measured on a Brookfield No. 1 spindle at 12 rpm at 25° C., and a specific gravity at 25° C. of from about 1.050 to about 1.046, and

f. said sodium polyphosphate being present in part as insoluble particles having an average diameter of about 1 to about 10 microns.

4,597,890

SOLVENT BLEND FOR REMOVING FLUX RESIDUES

Susan M. Dallessandro; Wesley L. Archer, both of Midland, Mich., and Stephen P. Krupp, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 15, 1985, Ser. No. 702,289

Int. Cl.[4] B08B *3/08;* C07C *17/42;* C11D *7/50;* C23G *5/028*

U.S. Cl. 252—153 3 Claims

1. A methylchloroform defluxing solvent composition have no flash point as measured by Cleveland Open Cup method consisting of:

(a) 93 to 96% by volume of methylchloroform containing by volume (1) 0.69–0.80% butylene oxide, (2) 0.35–0.45% nitromethane and (3) 3.0–3.4% diethylene ether as stabilizers based on the methylchloroform and

(b) 4 to 7% by volume of a mixture of 2-butanol and 3-methyl-1-butyn-3-ol wherein the alcohols are present in amounts of 3 to 5% and 1 to 2%, respectively, based on the total volume of the defluxing composition.

4,597,891

LIQUID CRYSTAL COMPOSITIONS AND DEVICES AND NOVEL COMPOUNDS

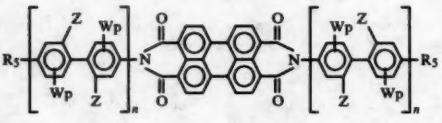
Howard G. Rogers, Weston, Mass.; Russell A. Gaudiana, Merrimack, N.H.; Cynthia B. McGowan, Stoneham, Mass.; Kenneth S. Norland, and Ronald J. Sahatjian, both of Lexington, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 4, 1984, Ser. No. 616,975

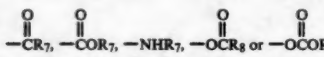
Int. Cl.[4] C02F *1/13;* C09K *3/34;* C07C *403/00*

U.S. Cl. 252—299.1 15 Claims

1. A liquid crystal composition comprising a liquid crystal material and at least one perylene dye represented by the formula

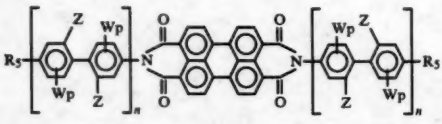


wherein W is hydrogen or a substituent other than hydrogen; Z is a substituent other than hydrogen; R_5 is hydrogen, halogen, alkyl having from 1 to 10 carbon atoms, alkoxy having from 1 to 10 carbon atoms, phenyl, cyano, nitro,

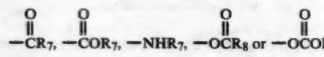


R_7 is hydrogen, alkyl having from 1 to 10 carbon atoms, phenyl or biphenyl; R_8 is alkyl having from 1 to 10 carbon atoms, phenyl or biphenyl; n is 1 or 2 and p is an integer of from 1 to 3; said W and Z substitution being sufficient to provide the biphenylene radicals to which they are attached with a non-coplanar molecular configuration.

13. A perylene compound represented by the formula



wherein W is hydrogen or a substituent other than hydrogen; Z is a substituent other than hydrogen; R_5 is hydrogen, halogen, alkyl having from 1 to 10 carbon atoms, alkoxy having from 1 to 10 carbon atoms, phenyl, cyano, nitro,



R_7 is hydrogen, alkyl having from 1 to 10 carbon atoms, phenyl or biphenyl; R_8 is alkyl having from 1 to 10 carbon atoms, phenyl or biphenyl; n is 1 or 2 and p is an integer of from 1 to 3; said W and Z substitution being sufficient to provide the biphenylene radicals to which they are attached with a non-coplanar molecular configuration.

4,597,892

LIQUID CRYSTALLINE 2-SUBSTITUTED-5-(1-ALKYL-PIPERID-4-YL)-1,3-DIOXANES

Horst Zaschke; Hans-Matthias Vorbrodt; Wilfried Fuchs, all of Halle; Adelbert Wiegeleben, Zörbig, and Dietrich Demus, Halle, all of German Democratic Rep., assignors to VEB Werk fuer Fernsehelektronik im VEB Kombinat Mikroelektronik, Berlin, German Democratic Rep.

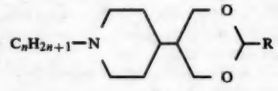
Filed Jun. 26, 1985, Ser. No. 749,042

Claims priority, application German Democratic Rep., Jul. 11, 1984, 265128; Jul. 11, 1984, 265129

Int. Cl.[4] C09K *3/34;* G02F *1/13;* C07D *407/00, 405/04*

U.S. Cl. 252—299.61 14 Claims

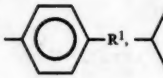
1. Liquid crystalline 5-(1-alkyl-piperid-4-yl)-1,3-dioxanes of the general formula I

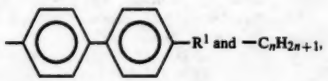


I

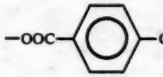
wherein

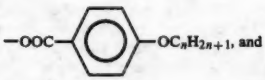
R=one of

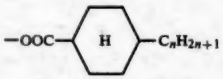




R^1=one of $-C_nH_{2n+1}$, $-OC_nH_{2n+1}$, $-OOCC_nH_{2n+1}$, $-COC_nH_{2n+1}$, $-OCOOC_nH_{2n+1}$, —F, —Cl, —Br, —I, $-NO_2$, —CN, $-(CH_2)_2CN$,







and

n=1 to 10.

4,597,893

DISPERSANT COMPOSITION

Derek C. Byford, Virginia Water; Peter J. Green, Sunbury-on-Thames, and Alun Lewis, Hounslow, all of England, assignors to The British Petroleum Company p.l.c., London, England

Filed Jun. 6, 1983, Ser. No. 501,367

Claims priority, application United Kingdom, Jun. 12, 1982, 8217136

Int. Cl.[4] B01F *17/00*

U.S. Cl. 252—354 10 Claims

1. A dispersant composition suitable for dispersing crude oil

or petroleum products floating on the surface of water comprises;

(A) 8 to 58% by weight of a non-ionic surfactant which is an ester of a polyalkoxylated sorbitol or sorbitan and a fatty acid having from 12 to 20 carbon atoms,

(B) 7 to 30% weight of an anionic surfactant which is selected from the group comprising calcium sulphonate, magnesium sulphonate, sodium sulphonate, triethanolamine sulphonate and isopropylamine sulphonate,

(C) 85 to 30% by weight of a solvent which comprises one or more alcohol, glycol or glycol-ether each of which has from 5 to 10 carbon atoms, and

(D) 0 to 15% by weight water,

the ratio of non-ionic surfactant to anionic surfactant being from 5:1 to 1:2.

4,597,894

COMPOSITION CONTAINING ORGANOPOLYSILOXANE HAVING POLYOXYALKYLENE AND PERFLUOROALKYL UNITS

Akira Abe, and Nobuyuki Terse, both of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1984, Ser. No. 597,456

Claims priority, application Japan, Apr. 11, 1983, 58-63394

Int. Cl.[4] B01D *17/00*; C07F *7/04*

U.S. Cl. 252—358 7 Claims

1. An antifoam silicone composition which comprises:

(a) 100 parts by weight of an organopolysiloxane having polyoxyalkylene moieties and perfluoroalkyl groups and represented by the average unit formula

$$R_aG_bQ_cSiO_{\frac{4-a-b-c}{2}},$$

in which R is a hydrogen atom or a monovalent hydrocarbon group having from 1 to 6 carbon atoms, G is polyoxyalkylene residue represented by the general formula

$$A\text{-}(C_2H_4\text{-}O\text{-})_k(\text{-}R^1\text{-}O\text{-})_q(\text{-}R^2\text{-})_m(\text{-}O\text{-})_n,$$

A being a terminal group selected from the group consisting of a hydrogen atom, alkyl groups, acyl groups and isocyanato groups, R^1 being selected from the group consisting of n-propylene; isopropylene, n-butylene and isobutylene, R^2 being selected from the group consisting of ethylene, n-propylene, isopropylene, n-butylene and isobutylene, k and q each being a positive integer and m and n each being 0 or 1; Q is a group represented by the formula R_fR^3—, or R_fR^3—S—R^4— in which R_f is a perfluoroalkyl group having from 1 to 18 carbon atoms, R^3 is a divalent hydrocarbon group having from 1 to 12 carbon atoms and R^4 is an ethylene group or a propylene group, with the proviso that Q does not contain more than 20 carbon atoms, and a, b and c are each a positive number with the proviso that a+b+c is in the range from 1.9 to 2.2 inclusive, and

(b) from 0.1 to 200 parts by weight of a perfluoroalkyl-containing organopolysiloxane represented by the average unit formula

$$R_dQ_eSiO_{\frac{4-d-e}{2}},$$

in which R and Q each have the same meaning as defined above and d and e are each a positive number with the proviso that d+e is in the range from 1.9 to 2.2 inclusive.

4,597,895

AEROSOL CORROSION INHIBITORS

Philip L. Bartlett, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 6, 1984, Ser. No. 678,882

Int. Cl.[4] C09K *3/30*

U.S. Cl. 252—392 6 Claims

1. In an aerosol composition containing an aqueous aerosol-dispersible media and a propellant, the improvement which comprises the presence of a corrosion inhibiting composition comprising 15 wt. % to 85 wt. % of nitroalkane containing 1–3 carbon atoms and 85 wt. % to 15 wt. % of cocoamide of diethanolamine wherein the mole ratio of the diethanolamine to coconut fatty acid is 1:1 to 2:1, said corrosion inhibiting composition being present in an amount sufficient to prevent more than light corrosion of a tin-plated steel aerosol can containing said aerosol composition.

6. In an aerosol propellant for use in a water-based aerosol composition, the improvement which comprises the presence of a corrosion inhibitor composition comprising 15 wt. % to 85 wt. % of nitroalkane containing 1–3 carbon atoms and 85 wt. % to 15 wt. % of cocoamide of diethanolamine wherein the mole ratio of the diethanolamine to coconut fatty acid is 1:1 to 2:1, said corrosion inhibiting composition being present in an amount sufficient to prevent more than light corrosion of a tin-plated steel aerosol can containing said aerosol composition.

4,597,896

CARBAZOLE-OXADIAZOLE ELECTROACTIVE POLYMERS

Peter Denisevich, Jr., Fairfax; Albert H. Schroeder, Richmond; Victor P. Kurkov, San Rafael, and Shigeto Suzuki, San Francisco, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 25, 1984, Ser. No. 664,892

Int. Cl.[4] H01B *1/00*

U.S. Cl. 252—500 10 Claims

1. A tractable electroactive polymer which comprises a charged polymer backbone of recurring units of a 3,6-N-substituted carbazole-1,3,4-oxadiazole-2,5-diyl, wherein the carbazole nitrogen is substituted with lower alkyl of 1 to 6 carbon atoms or phenyl, and a sufficient concentration of a charge-compensating ionic dopant associated therewith, wherein the polymer backbone is capable of undergoing reversible oxidation to form the charged polymer backbone.

4,597,897

HEXABORIDE RESISTOR COMPOSITION

Paul C. Donohue, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 24, 1985, Ser. No. 747,880

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—518 9 Claims

1. In a composition for the preparation of thick film resistors comprising an admixture of finely divided particles of conductive metal hexaboride and a glass inorganic binder at least 70 mole % of which binder consists of oxides which are irreducible by the conductive metal hexaboride, the improvement in combination therewith consisting essentially of addition to the admixture of finely divided SiO_2 particles in the amount of 0.3–2.5% wt., basis total solids.

4,597,898

DETERGENT COMPOSITIONS CONTAINING ETHOXYLATED AMINES HAVING CLAY SOIL REMOVAL/ANTI-REDEPOSITION PROPERTIES

James M. Vander Meer, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

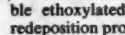
Filed Dec. 23, 1982, Ser. No. 452,646
Int. Cl.[4] C11D 1/44, 3/32, 3/37
U.S. Cl. 252—529 **29 Claims**

1. A liquid laundry detergent composition, which comprises:

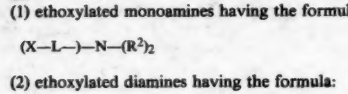
(a) from about 1 to about 75% by weight of a detergent surfactant selected from the group consisting of nonionic, anionic, ampholytic, zwitterionic and cationic detergent surfactants and mixtures thereof;

(b) from about 0.05 to about 95% by weight of a water-soluble ethoxylated amine having clay soil removal/anti-redeposition properties selected from the group consisting of:

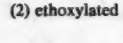
(1) ethoxylated monoamines having the formula:



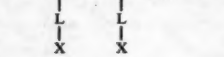
(2) ethoxylated diamines having the formula:



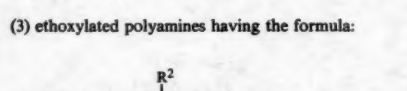
or



(3) ethoxylated polyamines having the formula:

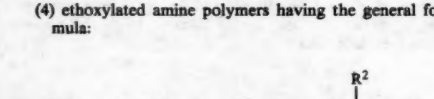


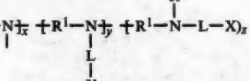
(4) ethoxylated amine polymers having the general formula:



and

(5) mixtures thereof; wherein A^1 is





or —O—; R is H or C_1–C_4 alkyl or hydroxyalkyl; R^1 is C_2–C_{12} alkylene, hydroxyalkylene, alkenylene, arylene or alkarylene, or a C_2–C_3 oxyalkylene moiety having from 2 to about 20 oxyalkylene units provided that no O—N bonds are formed; each R^2 is C_1–C_4 alkyl or hydroxyalkyl, the moiety —L—X, or two R^2 together form the moiety $—(CH_2)_r—A^2—(CH_2)_s—$, wherein A^2 is —O— or $—CH_2—$, r is 1 or 2, s is 1 or 2, and r+s is 3 or 4; X is H; R^3 is a substituted C_3–C_{12} alkyl, hydroxyalkyl, alkenyl, aryl or alkaryl group having p substitution sites; R^4 is C_1–C_{12} alkylene, hydroxyalkylene, alkenylene, arylene or alkarylene, or a C_2–C_3 oxyalkylene moiety having from 2 to about 20 oxyalkylene units provided that no O—O or O—N bonds are formed; L is a hydrophilic chain which contains the polyoxyalkylene moiety $—[(R^5O)_m(CH_2CH_2O)_n]—$, wherein R^5 is C_3–C_4 alkylene or hydroxyalkylene and m and n are numbers such that the moiety $—(CH_2CH_2O)_n—$ comprises at least about 50% by weight of said polyoxyalkylene moiety; for said monoamines, m is from about 0 to about 4, and n is at least about 12; for said diamines, m is from 0 to about 3, and n is at least about 6 when R^1 is C_2–C_3 alkylene, hydroxyalkylene, or alkenylene, and at least about 3 when R^1 is other than C_2–C_3 alkylene, hydroxyalkylene or alkenylene; for said polyamines and amine polymers, m is from 0 to about 10 and n is at least about 3; p is from 3 to 8; q is 1 or 0; t is 1 or 0, provided that t is 1 when q is 1; w is 1 or 0; x+y+z is at least 2; and y+z is at least 2; provided that when w and x are 0, said amine polymers are cyclic; and

(c) an optical brightener.

23. A composition according to claim **1** which further comprises a detergent builder selected from the group consisting of inorganic phosphate builders, polyphosphonate builders, citric acid, and alkali metal, ammonium and substituted ammonium salts of citric acid.

4,597,899

PROCESS FOR OBTAINING A FACTOR XIII PREPARATION, AND ITS USE

Jürgen Falke, Marburg, Fed. Rep. of Germany, assignor to Behringwerke Aktiengesellschaft, Marburg, Fed. Rep. of Germany

Filed May 23, 1985, Ser. No. 737,058
Claims priority, application Fed. Rep. of Germany, May 25, 1984, 3419581
Int. Cl.[4] C07K 3/20, 3/22, 3/24; A61K 35/48
U.S. Cl. 530—383 **4 Claims**

1. A process for obtaining a factor XIII preparation from an aqueous extract of placentae, which comprises precipitating the factor XIII for said extract with a lower alkanol, dissolving the residue in an aqueous solution, bringing the solution into contact with an anion exchanger, removing the liquid, washing the exchanger with a liquid which does not desorb factor XIII, and eluting the factor XIII.

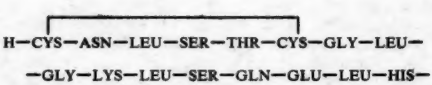
4,597,900

DES^2-GLYCINE^8-DES^{22}-CALCITONIN

Ronald C. Orlowski, Frankfort, and Jay K. Seyler, Bourbonnais, both of Ill., assignors to Armour Pharmaceutical Co., Tarrytown, N.Y.

Filed Aug. 22, 1983, Ser. No. 525,356
Int. Cl.[4] C07K 7/36
U.S. Cl. 530—307 **4 Claims**

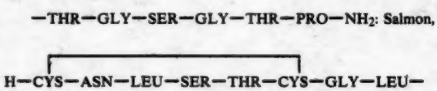
1. A peptide having the structure:



—GLY—LYS—LEU—SER—GLN—GLU—LEU—HIS—

—LYS—LEU—GLN—THR—PRO—ARG—THR—ASN—

—THR—GLY—SER—GLY—THR—PRO—NH_2: Salmon, or



—GLY—LYS—LEU—SER—GLN—GLU—LEU—HIS—

—LYS—LEU—GLN—THR—PRO—ARG—THR—ASP—

—VAL—GLY—ALA—GLY—THR—PRO—NH_2: Eel.

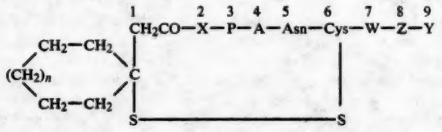
4,597,901

β-INDOLYLALANYL OR β-INDOLYLGLYCINYL VASOPRESSIN ANTAGONISTS

Nelson C. Yim, Ambler, Pa., assignor to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Dec. 14, 1984, Ser. No. 681,461
Int. Cl.[4] C07K 7/16
U.S. Cl. 530—328 **8 Claims**

1. A polypeptide compound having the formula:



in which:

X is TRP, D-Phe, D-Phe(4'-Alk), D-Tyr, L-Tyr, D-Tyr-(OAlk) or L-Tyr(OAlk);

P is Phe, Phe(4'-Alk) or TRP;

A is Val, Ile, Abu, Ala, Gly, Lys, Cha, Nle, Phe, Leu, Chg or Nva;

W is D-Pro or L-Pro;

Z is D-Arg, L-Arg, D-Lys, L-Lys or Harg;

Y is NH_2, NHAlk, OH, Gly, Gly(NH_2) or Gly(NHAlk); and

n is 0, 1 or 2, with the provisions, that one of X and P must be TRP and each Alk contains from 1–4 carbons, or a pharmaceutically acceptable salt thereof.

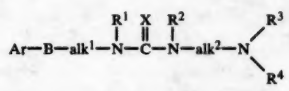
4,597,902

N-(ARYLTHIOALKYL)-N'-(AMINOALKYL)UREAS

James R. Shanklin, Jr., and Christopher P. Johnson, III, both of Richmond, Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

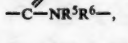
Continuation-in-part of Ser. No. 549,738, Nov. 18, 1983, abandoned, which is a continuation-in-part of Ser. No. 345,452, Feb. 3, 1982, abandoned, which is a continuation-in-part of Ser. No. 265,278, May 20, 1981, abandoned. This application Jun. 20, 1985, Ser. No. 746,740
Int. Cl.[4] C07C 127/17, 157/07; A61K 31/07
U.S. Cl. 262—239 B **140 Claims**

1. A compound selected from the group having the formula



wherein;

Ar is selected from the group consisting of 1 and 2-naphthyl, 2,3-dihydro-1H-inden-4(or 5)yl, 2-furanyl, phenyl or phenyl substituted by 1–3 radicals which may be the same or different selected from the group consisting of lower alkyl, loweralkoxy, halogen, trifluoromethyl, nitro, cyano, hydroxy, amido, dimethylamino or

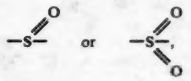


wherein R^5 and R^6 are selected from hydrogen or loweralkyl, and Ar may include one or two intervening methylene groups attached to B,

R^1 and R^2 are selected from the group consisting of hydrogen, loweralkyl, cycloalkyl, phenyl or phenyl-loweralkyl wherein phenyl may be substituted by halogen, loweralkyl, loweralkoxy, allyl or loweralkoxy (1–8 C)-loweralkyl (2–8 C),

X is selected from oxygen or sulfur,

B is selected from the group consisting of —S—,



R^3 and R^4 are selected from the group consisting of hydrogen, loweralkyl, phenyl and phenyl-loweralkyl wherein phenyl may be substituted by halogen, loweralkyl or lower-alkoxy and may be the same or different, or R^3 and R^4 taken together with the adjacent nitrogen form a heterocyclic residue;

alk^1 and alk^2 are selected from the group consisting of loweralkylene or loweralkylene-loweralkyl and may be the same or different, and

the pharmaceutically acceptable addition salts and hydrates of the salts and free bases.

4,597,903

PROCESS FOR THE DIRECT PREPARATION OF N,N-DISUBSTITUTED DERIVATIVES FOR 4,13-DIAZA-18-CROWN-6

George W. Gokel, Columbia, and Vincent J. Gatto, Silver Spring, both of Md., assignors to University of Maryland, College Park, Md.

Filed Aug. 21, 1984, Ser. No. 642,985
Int. Cl.[4] C07D 273/08
U.S. Cl. 260—330.6 **9 Claims**

1. A process for the direct preparation of N,N-disubstituted derivatives of 4,13-diaza-18-crown-6 in which the both nitrogen atoms in the ring have identical substituents and derive originally from an amine, comprising reacting a 1,8-diiodo-3,6-dioxaoctane or alkyl or aryl derivatives thereof with a molar equivalent of a primary amine having 1–12 carbon atoms in the molecule in the presence of an alkali metal or alkaline earth metal carbonate base and a nitrile, formamide or sulfoxide solvent at a temperature of 25° to 175° C. for a period of 12 to 60 hours, wherein the concentration of amine and diiodide in the solvent are in the range 0.1 to 0.5 molar and the amount of base relative to the amine is 4–6 molar equivalents.

4,597,904

PROCESS FOR THE PREPARATION OF α-6-DEOXY-TETRACYCLINES

Philip R. Page, Parede, Portugal, assignor to Hovione Inter Ltd., Switzerland

Filed Aug. 17, 1984, Ser. No. 641,607
Claims priority, application Portugal, Aug. 17, 1983, 77210[U]; Mar. 29, 1984, 78334[U]
Int. Cl.[4] C07C 103/19
U.S. Cl. 260—351.5 **13 Claims**

1. A process for the preparation of α-6-deoxy-tetracyclines by the stereoselective heterogeneous hydrogenation of a 6-demethyl-6-deoxy-6-methylene-tetracycline or an acid addition salt thereof, in the presence of a tertiary phosphine, or the simultaneous dehalogenation and stereoselective hydrogenation of an IIa-halo-6-demethyl-6-deoxy-6-methylene-tetracycline or an acid addition salt thereof, in the presence of a tertiary phosphine, characterised by the use of a rhodium salt catalyst, wherein the rhodium is bonded to an aminopolysiloxane.

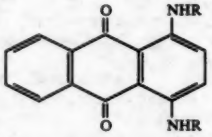
4,597,905
METHOD FOR ACYLATING AMINOANTHRAQUINONES

Brooks Edwards, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

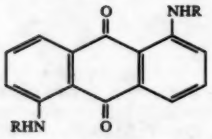
Filed Aug. 27, 1984, Ser. No. 644,914
Int. Cl.[4] C07C *103/75*
U.S. Cl. 260—377 **4 Claims**

1. A method for forming an acylated aminoanthraquinone dye comprising:

reducing an aminoanthraquinone dye represented by the formula



or



wherein

R is an aliphatic group or an aryl group to form a leuco dye intermediate,

reacting said leuco dye intermediate with an acylating agent to form an acylated leuco dye, and

oxidizing said acylated leuco dye to give an acylated anthraquionone dye.

4,597,906
SURFACE-ACTIVE COMPOUNDS ON THE BASIS OF ARYLATED FATTY SUBSTANCES AND THEIR USE

Heinz Uhrig, Steinbach; Klaus Ehl, Frankfurt am Main, and Reinhold Deubel, Bad Soden am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 214,755, Dec. 9, 1980, abandoned. This application Dec. 27, 1983, Ser. No. 565,906
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1979, 2949694
Int. Cl.[4] C08H *3/00*
U.S. Cl. 260—401 **10 Claims**

1. A compound of the formula

$$A[(Y—O)_x—Y—Z]_m$$

in which A is the radical of an arylated fatty acid or esterification product thereof, Y denotes identical or different groups of the formulae

$$—CH_2—CH_2— \text{ or } —CH_2—CH(CH_3)—,$$

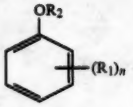
Z denotes identical or different radicals of the formulae —OH, —O—CO—CH=C—COOM and —O—CO—CH_2—CH(SO_3M)—COOM, in which

M is a cation,

x is an integer of from 1 to 150 and

m is a number of from 1 to 7,

with the exception of the oxalkylation products of difatty acid ester substituted phenolic compounds obtainable by a process which comprises the steps of reacting, at elevated temperature, in the presence of an acidic catalyst, an unsaturated fatty acid ester produced by reacting an unsaturated fatty acid having from 10 to 22 carbon atoms with a saturated alcohol containing from 1 to 8 carbon atoms or a mixture of such esters with 0.2 to 0.8 mol per mole of the unsaturated fatty acid ester, of a phenolic compound of the formula



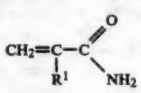
where R_1 is an alkyl group containing 1 to 4 carbon atoms or OH, R_2 is —H, —CH_3 or —CH_2CH_3, and n is 0, 1 or 2 with the proviso that at least one hydroxy group is present in the phenolic compound and at least two of the ortho- and para-positions on the benzene ring with respect to the —OR_2 are unsubstituted, subsequently isolating the product derived from 1 mole of the phenolic compound and 2 moles of the fatty acid ester, and then reacting the product with ethylene oxide or propylene oxide.

4,597,907
PREPARATION OF α-SUBSTITUTED ACRYLAMIDES

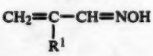
Franz Merger, Frankenthal, and Wolfgang Schwarz, Pfinztal, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 3, 1984, Ser. No. 677,309
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1983, 3343675
The portion of the term of this patent subsequent to Jun. 10, 2003, has been disclaimed.
Int. Cl.[4] C11C *3/00*; C07C *102/10*
U.S. Cl. 260—404 **6 Claims**

1. A process for the preparation of an α-substituted acrylamide of the formula I


(I)

where R^1 is a straight-chain, branched or cyclic alkyl radical of not more than 15 carbon atoms which can be unsubstituted or further substituted, from an aldoxime of the formula II


(II)

where R^1 has the above meaning, wherein the aldoxime is heated at from 40° to 250° C. in the presence of a carrier-free copper(II) carboxylate obtained from a monocarboxylic acid of 5 to 18 carbon atoms.

4,597,908
PROCESS FOR HYDROGENATING FATTY COMPOUNDS BY USE OF A TRANSITION METAL/TRANSITION METAL SILICATE CATALYST

Cornelis M. Lok, Rockanje, and Keshab L. Ganguli, Bleiswijk, both of Netherlands, assignors to Internationale Octrooi Maatschappij "Octropa" B.V., Rotterdam, Netherlands

Division of Ser. No. 678,798, Dec. 5, 1984. This application Sep. 23, 1985, Ser. No. 778,687
Claims priority, application Netherlands, Dec. 6, 1983, 8304184
Int. Cl.[4] C11C *3/12*; B01J *23/70, 21/08*; C07C *85/12*
U.S. Cl. 260—409 **2 Claims**

1. In a process for the catalytic hydrogenation of unsaturated compounds consisting of oils, fats, fatty acids, fatty nitriles and other fatty derivatives at a temperature between 80° and 250°

C., the improvement which comprises using, as the catalyst, a transition metal/transition metal silicate catalyst, which contains 30 to 70% of active metal, calculated on the total weight of the catalyst, wherein the active metal surface area is between 100 and 160 m^2/g in the case of nickel and between 1 and 25 m^2/g in the case of cobalt and copper, and wherein the BET total surface area and the pore volume are at least 20% higher and the filtration speed from the hydrogenated mixture is at least 5× that of a coprecipitated catalyst of the same composition.

4,597,909

PROCESS FOR THE PRODUCTION OF POLYISOCYANATES

Berthold Keggenhoff; Enno Mühlmann, both of Krefeld; Willi Eifler, Bergisch-Gladbach, and Günther Ellendt, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 21, 1985, Ser. No. 703,843

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1984, 3407494

Int. Cl.⁴ C07C *118/02*

U.S. Cl. 560—347 **5 Claims**

1. A process for the preparation of polyisocyanates of the diphenylmethane series comprising:

(a) at a temperature below 50° C., reacting either from 2.0 to 3.5 moles of aniline with 1 mole of formaldehyde in the presence of hydrochloric acid, or a condensation product in the presence of hydrochloric acid, said condensation product produced by reacting from 2.0 to 3.5 moles of aniline with 1 mole of formaldehyde in the absence of acid catalysts, the hydrochloric acid being present in an amount such that the degree of protonation is from 40 to 60%,

(b) adding aniline to the product of step (a) in an amount such that the molar ratio of (i) amine nitrogen atoms in the form of free aniline and the reaction products formed in step (a) to (ii) formaldehyde bound in the form of methylene bridges in such reaction products rises to more than 10:1 and up to 20:1 with the degree of protonation decreasing correspondingly,

(c) heating the reaction mixture of step (b) to allow the N-substituted intermediate products present to be completely rearranged into polyamines containing unsubstituted primary amino groups,

(d) working up the reaction mixture of step (c) by neutralization of the acid and by distillation off of the excess aniline from the organic phase to thereby obtain polyamines having a high diamine content and a low 2,2'-diaminodiphenylmethane content, and

(e) phosgenating the resultant polyamine.

4,597,910

BIS-(4-ISOCYANATOPHENOXY)-ALKANES AND A PROCESS FOR THE PRODUCTION THEREOF

Klaus König, Leverkusen, and Peter Heitkämper, Dormagen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

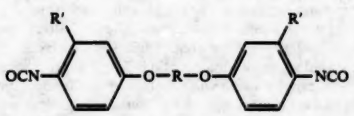
Filed Nov. 8, 1985, Ser. No. 796,128

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1984, 3442689; Jul. 18, 1985, 3525606

Int. Cl.⁴ C07C *118/00*; C08G *18/00*

U.S. Cl. 560—359 **8 Claims**

1. A bis-(4-isocyanatophenoxy)-alkane corresponding to the formula



in which

R represents a divalent, saturated aliphatic hydrocarbon radical having from 2 to 6 carbon atoms with at least two carbon atoms between the two ether oxygen atoms and

R' represents hydrogen or a methyl group with R' being the same on both rings.

4,597,911

PRODUCTION OF AMINO ALIPHATIC AND CYCLOALIPHATIC HYDROGEN SULFATES

Michael E. Ford, Center Valley, and Thomas A. Johnson, Orefield, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 14, 1983, Ser. No. 561,616

Int. Cl.⁴ C07C *141/02, 141/12*

U.S. Cl. 558—29 **5 Claims**

1. In a process for producing a hydrogen sulfate ester by reacting an amino compound selected from the group consisting of C_{2-8} alkanolamines, hydroxy ethyl urea, aminocyclohexanol, aminoethylcyclohexanol, and N-acetyl monoethanolamine with a sulfate radical providing compound, the improvement which comprises utilizing ammonium bisulfate as the sulfate providing radical, and carrying out the reaction at a temperature from 100°–200° C., and maintaining a mole ratio of ammonium bisulfate to said amino compound of 2–10:1.

4,597,912

BASIC COLORANTS

Manfred Eisert, Ludwigshafen, and Klaus Grychtol, Bad Durkheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

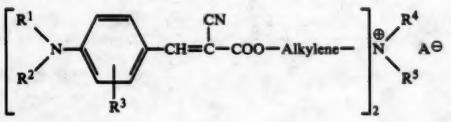
Continuation of Ser. No. 188,264, Sep. 17, 1980, abandoned. This application May 17, 1985, Ser. No. 735,298

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1979, 2942185

Int. Cl.⁴ C07C *121/70, 121/72*

U.S. Cl. 558—403 **3 Claims**

1. A compound of the formula:



wherein

R^1 and R^2 independently of one another are methyl or ethyl;

R^3 is hydrogen;

R^4 and R^5 independently of one another are hydrogen, C_1- to C_4-alkyl or benzyl; and

$A^\ominus$ is an anion selected from the group consisting of chloride, bromide, sulfate, nitrate, dihydrogen phosphate, methosulfate, ethosulfate, thiocyanate, formate, acetate, propionate, chloroacetate, citrate and lactate; and the alkylene radicals of 2 to 6 carbon atoms in the cyano substituted cinnamoyl groups are independent of each other and are linear or branched.

4,597,913

INTERMEDIATES FOR FLUORINATED CATION EXCHANGE MEMBRANE

Kyoji Kimoto, Kanagawa; Hirotsugu Miyauchi, Tokyo; Jukichi Ohmura, Kanagawa; Mikio Ebisawa, Kanagawa, and Toshioki Hane, Kanagawa, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 299,164, Sep. 3, 1981, Pat. No. 4,510,328, which is a division of Ser. No. 152,847, May 23, 1980, Pat. No. 4,329,434. This application Aug. 29, 1983, Ser. No. 527,426

Claims priority, application Japan, May 31, 1979, 54-67888; May 31, 1979, 54-67889; Jul. 9, 1979, 54-85852; Jul. 18, 1979, 54-90301; Jul. 18, 1979, 54-90302

Int. Cl.[4] C07C *121/16, 143/08*

U.S. Cl. 558—436 4 Claims

1. A fluorinated carboxylic acid derivative having the formula:

$$X(CF_2)_2Y$$

wherein X is $-SR^1$ or $-SO_2R^2$; R^1 is C_1–C_{10} alkyl, C_1–C_{10} perfluoroalkyl or chlorine; R^2 is R^1 or —OM where M is hydrogen, on alkali metal or ammonium; Y is $-COY^1$ or —CN; Y^1 is halogen, hydrogen, $-NH_2$, —OM wherein M is defined above, or $-OR^3$; and R^3 is C_1–C_{10} alkyl.

4,597,914

METHOD FOR THE PREPARATION OF AROMATIC SELENIUM COMPOUNDS

Daniel J. Sandman, Acton, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jun. 23, 1983, Ser. No. 507,156

Int. Cl.[4] C07C *163/00;* C01B *19/04;* C08G *79/00*

U.S. Cl. 260—550 11 Claims

1. A method of preparing monomeric and polymeric aromatic organic selenium compounds comprising reacting a suspension of finely divided selenium with an alkali metal in a polar aprotic solvent, wherein the molar ratio of alkali metal to selenium is about 2:1, to produce an alkali metal monoselenide reagent; and reacting said alkali metal monoselenide reagent with monohalo-aromatic compound to produce a bis-aryl selenide characterized by the formula Ar-Se-Ar, wherein Ar signifies the aryl group, or with a dihalo-aromatic compound to produce a polymeric aromatic selenium compound characterized by the formula $(Ar—Se)_n$ wherein Ar is an aryl group and n is an integer greater than 1, the polymeric aromatic selenium compound having a selenium content of not more than about 15% in excess of a stoichiometric amount.

4,597,915

CARBURETOR PERCOLATION PREVENTION SYSTEM

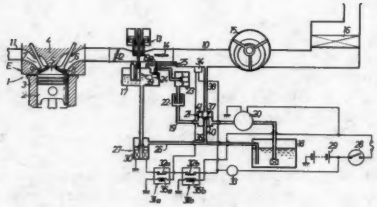
Hidenobu Nagase, Saitama, and Yuji Makino, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1984, Ser. No. 573,488

Claims priority, application Japan, Jan. 27, 1983, 58-11961

Int. Cl.[4] F02M *5/10*

U.S. Cl. 261—29 1 Claim



1. A carburetor percolation prevention system for an internal combustion engine including an air inlet passage, a float valve, at least one fuel injection nozzle, an ignition switch, a fuel tank, a fuel pump, a supercharger, and an electrical power source, comprising a float chamber with at least one fuel injection nozzle mounted therein, said chamber having a vent communicating the float chamber to the air inlet passage and a fuel communication passage to the fuel tank, a fuel drain passage communicating said float chamber and the fuel tank, an electrically controlled fuel drain valve disposed within said fuel drain passage, a recirculation passage comunicating said fuel communication passage and the fuel tank, a pressure regulator valve disposed between said fuel communication passage and said recirculation passage, said prssure regulator valve having a spring biased diaphragm, one side of said diaphragm having communication with the air inlet passage near the supercharger exit, the unbiased side of said diaphragm having communication with the fuel pump exit, a temperature sensor located near said float chamber, electrical switching means located between the electrical power source and said fuel drain valve such that said drain valve is opened only if the ignition switch is open and said temperture sensor detects a temperature in excess of a predetermined level, and a timer means to disconnect said fuel drain valve from said power source after said drain valve has been open for a predetermined time.

4,597,916

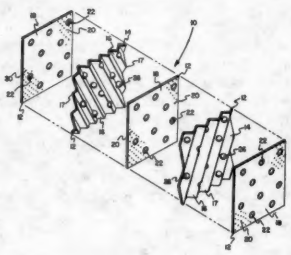
METHOD OF AND APPARATUS FOR INTERMEDIATE LAMELLA VAPOR LIQUID CONTACT

Gilbert Chen, Farmers Branch, Tex., assignor to Glitsch, Inc., Dallas, Tex.

Continuation of Ser. No. 506,417, Jun. 21, 1983, abandoned. This application Apr. 19, 1985, Ser. No. 725,144

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—94 14 Claims



9. An improved method of improving vapor liquid contact within a process tower of the type comprising the steps of providing a generally vertical tower having means for ingressing the flow of vapor at the lower region thereof and means for ingressing a stream of liquid at the upper region thereof and a series of layers of grid sections comprising generally vertical oriented corrugated sheets of unexpanded material with the corrugations of adjacent sheets being inclined one to the other between said liquid and vapor ingressing means for receiving the descending flow of liquid and the ascending flow of vapor concomitantly therethrough for the thorough mass and/or heat transfer therebetween, said improvement comprising the steps of providing said corrugated sheets with a plurality of parallel, elongate, spaced apart slits formed through solid surfaces of each sheet with the total area of all of said slits being smaller than the total area of said solid surfaces, providing said slitted sheets with a plurality of relatively larger apertures spaced apart by said solid surfaces for effecting the flow of vapor and liquid therealong and within the corrugations of said adjacent sheets for enhancing the vapor liquid interaction, and the further step of orienting the longitudinal axes of said elongate slits in said sheets to extend generally transversely to

said vapor liquid flow and said corrugations for imparting turbulence thereto along with a transverse spreading to the liquid flowing down and through said sheets, and the further step of inserting a perforated planar sheet along the notional plane between said corrugated sheets, said perforated sheet including a plurality of relatively larger orifices spaced apart by solid surfaces for effecting the flow of vapor and liquid therealong and within the corrugations and elongate slits of said adjacent sheets for enhancing the vapor liquid interaction flowing therethrough and substantially segregating the vapor and liquid flow of respective corrugated channels one from the other.

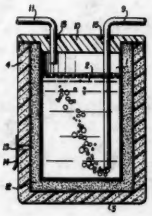
11. A tower packing comprising a plurality of sheets of unexpanded material, a plurality of corrugations formed on each sheet, said sheets being disposed in face-to-face contact with the corrugations of each sheet extending at an angle to the corrugations of its adjacent sheets to define flow paths for a descending liquid and an ascending vapor, a planar sheet of unexpanded material disposed along the notional plane between said corrugated sheets, a plurality of relatively large orifices formed through and spaced apart by solid surfaces of each planar sheet for permitting passage of said liquid and vapor therethrough to distribute the liquid over said sheets and equalize the pressure of said vapor, and a plurality of relatively small elongated slits formed through the solid surfaces of each of said planar sheets, the slits in each sheet being spaced longitudinally from each other in parallel rows with the longitudinal axes of said slits extending transversely across said corrugations, the total area of all of said slits being smaller than the total area of said solid surfaces, a portion of each sheet adjacent each slit being displaced from the plane of said sheet, to enhance vapor-liquid contact along said sheets.

4,597,917

PORTABLE MEDICAL GAS WARMING SYSTEM

Kevin S. Lunsford, 8273 Community Dr., Manassas, Va. 22110

Filed Apr. 19, 1983, Ser. No. 486,484
Int. Cl.⁴ B01F *3/04;* A61M *16/16*
U.S. Cl. 261—153 **22 Claims**



1. A hand-held portable medical gas warming apparatus for treating and preventing hypothermia, said apparatus comprising:

a disposable outer container means having a heat insulative lightweight outer wall, a rigid inner wall and a self-contained heating means comprising at least one exothermically reactive chemical substance disposed between said inner and outer walls;

inner cavity means substantially surrounded by said heating means through which therapeutic respiratory gases may be passed and simultaneously warmed by an exothermic reaction in said heating means without causing communication other than heat transfer between said heating means and said gases;

inlet means for introducing said gases into said cavity; and

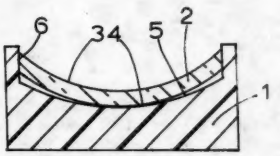
outlet means for removing said gases from said cavity after warming and for transmitting said warmed gases to a patient.

4,597,918

METHOD OF REMOVING SOFT CONTACT LENSES FROM THE MOLD

Charles W. Neefe, P.O. Box 429, Big Spring, Tex. 79720

Continuation-in-part of Ser. No. 670,386, Nov. 9, 1984, abandoned, which is a continuation-in-part of Ser. No. 544,468, Oct. 24, 1983, abandoned, which is a continuation-in-part of Ser. No. 417,641, Sep. 13, 1982, Pat. No. 4,416,837. This application Apr. 22, 1985, Ser. No. 725,988
Int. Cl.⁴ B29D *11/00*
U.S. Cl. 264—2.6 **12 Claims**



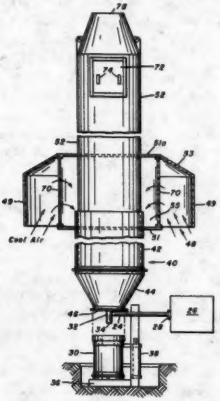
1. A method of removing spin cast xerogel lenses from the concave surface of the spin cast mold by the steps of hydrating and swelling the lens, allowing the hydrated lens to shrink and partially dehydrate by evaporating water from the concave lens surface, the convex lens surface being attached to the concave mold surface remains swelled and hydrated, the shrinkage of the concave lens surface provides a lens having a shorter radius of curvature than the radius of curvature present on the concave spin casting mold and the shorter radius lens separates from the longer radius lens mold.

4,597,919

PROCESS FOR THE PRODUCTION OF PARTICULATE METAL

Robert A. Ramser, New Kensington; Daniel R. Barch, Natrona Heights, both of Pa.; Kalman E. Buchovecky, Rockdale, Tex., and Ray A. Kuchera, Oakmont, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 413,513, Aug. 31, 1982, Pat. No. 4,468,183. This application Aug. 4, 1984, Ser. No. 595,622
Int. Cl.⁴ B29B *9/00*
U.S. Cl. 264—12 **9 Claims**



1. In a process for producing metal particles from a molten source of metal wherein a nozzle means is utilized for introducing atomized metal to a double walled cooling chamber, the improvement comprising the steps of:

(a) providing a double walled cooling chamber having an

opening spaced from the molten metal source to permit the free flow into said chamber of cooling air from the outside of said chamber and having the inner sidewall thereof extending from said opening to nozzle means and terminating adjacent an end wall carrying said nozzle means; and

(b) cooling said inner sidewall to inhibit the deposition of said metal particles on said inner sidewall when said molten metal is atomized into said chamber by flowing cool air from said opening across the outer surface of said inner sidewall;

whereby said chamber has improved resistance to deposition of metal particles on said sidewall.

4,597,920

SHRINK FILMS OF ETHYLENE/α-OLEFIN COPOLYMERS

Ralph C. Golike, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 415,703, Sep. 7, 1982, abandoned, which is a continuation-in-part of Ser. No. 256,812, Apr. 23, 1981, abandoned. This application Apr. 9, 1984, Ser. No. 598,476

Int. Cl.[4] **C08J** *5/18;* **C08L** *23/18;* **C08F** *10/14*

U.S. Cl. 264—22 **6 Claims**

1. In a process for making a shrink film having high optical clarity, good shrink properties, and good mechanical properties, said film being made by stretching a polymer film at least three times its original linear dimension in at least one direction,

the improvement of stretching a film made of the following homogeneous composition:

(1) 5–100 weight % of at least one linear copolymer of ethylene with at least one C_8–C_{18} ω-olefin, said copolymer having the following characteristics:

(a) melt index of 0.1–4.0 g/10 min.;

(b) density of 0.900 to 0.940 g/cm^3;

(c) stress exponent above 1.3; and

(d) two distinct crystalline melting regions below 128° C. as determined by differential scanning calorimetry (DSC), the temperature difference between those regions being at least 10° C.;

(e) $G=[\eta]/[\eta]_{lv}$ of about 0.85 to 1.00, wherein $[\eta]$ is the intrinsic viscosity of the copolymer and $[\eta]_{lv}$ is the intrinsic viscosity of linear homopolyethylene having the same viscosity-average molecular weight; and

(2) 0.95 weight % of at least one polymer selected from the group consisting of α-olefin homopolymers and copolymers with one another or with another ethylenically unsaturated comonomer, said polymer having only one crystalline melting point;

with the stretching being carried out without prior crosslinking and at a temperature within the range defined by the two crystallite melting points of the ethylene copolymer with C_8–C_{18} α-olefin of the above paragraph (1) but above any temperature at which tearing may occur.

4,597,921

PROVISION OF PLASTIC INSULATION UPON AN ELECTRICAL CONDUCTOR

Jorg-Hein Walling, Beaconsfield, and Peter M. Murphy, Nepean, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jul. 26, 1984, Ser. No. 634,556

Int. Cl.[4] **B29C** *63/18, 65/08*

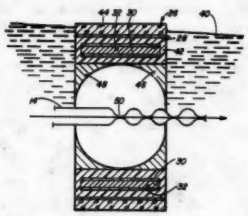
U.S. Cl. 264—23 **7 Claims**

1. A method of providing a plastic insulation upon an electrical conductor comprising:

enclosing the conductor within a radially oversize tube of the plastic;

with the plastic in a heated and softened condition, passing the tube and conductor together along a pass line through a fluid and through an annular crystal of a piezoelectric material immersed within the fluid; and

during passage of the tube and conductor, subjecting the crystal to an electric current to cause continuously alternating explansion and contraction of the crystal thereby to produce a succession of annular pressure shockwaves in the fluid radially within the crystal to form axially spaced-apart localized annular depressions in the hot tube and into contact



with the conductor thereby forming separate annular insulating spaces between conductor and tube, each shockwave providing an annular depression by focussing the shockwave in a localized region which coincides with a position along the pass line to cause a localized radially inward annular deformation of the heated and softened tube into engagement with the conductor and thereby forming the annular depression in the tube.

4,597,922

MOLDING RF MOLDABLE THERMOPLASTIC COMPOSITIONS

Daniel P. Durbin, Sugar Land, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 29, 1984, Ser. No. 614,626

Int. Cl.[4] **B29C** *35/08, 35/12*

U.S. Cl. 264—26 **8 Claims**

1. A process for the production of moldings from a dry blend mixture of between about 5% to 60% by weight of a radio frequency susceptible organic thermoplastic resin and between about 40% and about 95% by weight of a rigid substantially non-radio frequency absorbing inorganic particulate filler wherein said dry blend is poured into a non radio frequency absorbing mold and scintered using a radio frequency field to form a composite structure.

4,597,923

PRODUCTION OF REACTION-BONDED SILICON CARBIDE BODIES

Peter Kennedy, Preston, and Kenneth Parkinson, Liverpool, both of England, assignors to United Kingdom Atomic Energy Authority, England

Filed Aug. 29, 1984, Ser. No. 645,342

Claims priority, application United Kingdom, Sep. 9, 1983, 8324166

Int. Cl.[4] **C01B** *31/36*

U.S. Cl. 264—29.4 **9 Claims**

1. A method of producing a reaction-bonded silicon carbide artefact comprising applying a layer of a solid, flexible, and fibrous essentially carbonaceous material on a green body comprising a coherent mixture of carbon and silicon carbide powders, subjecting said layer to carbonization to form a solid layer of essentially carbon of open cellular structure on the green body and then siliconizing the resulting body to produce said reaction-bonded silicon carbide artefact.

4,597,924

TETRA-ALKYL TITANATES AS BONDING AGENTS FOR THERMOPLASTIC PROPELLANTS

Henry C. Allen, Decatur, and Frederick W. Clarke, Huntsville, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 21, 1985, Ser. No. 789,598
Int. Cl.[4] C06B 21/00
U.S. Cl. 264—3.6 2 Claims

1. In a process for utilizing a thermoplastic elastomer as a binder for a composite propellant composition and for forming a solid propellant grain of same, the process including the providing of a thermoplastic elastomer which consists of hard segments having substantially crystal line properties and soft segments having substantially amorphous properties, said hard segments imparting rigid properties to a solid propellant composition with which it is combined, and said soft segments imparting rubbery properties to a solid propellant composition with which it is combined; and dissolving said thermoplastic elastomer in an excess amount of a volatile organic solvent, the improvement in the processability and the mechanical properties of the formed solid composite propellant grain achieved by the improved process which comprises:

(i) adding and mixing an organic titanate bonding agent additive of the general formula $Ti(OR)_4$, where R is selected from the group of alkyl radicals, in an amount from about 0.1 weight percent to about 1.0 weight percent in said dissolved thermoplastic elastomer to react with the film of water on particle surfaces of subsequently added ammonium perchlorate and to deposit a coating of said organic titanate bonding agent additive on said ammonium perchlorate particle surfaces to thereby serve to improve processability and to provide a bonding substrate for said thermoplastic elastomer and to thereby enhance the adhesive bond between said ammonium perchlorate and said thermoplastic elastomer; and,

(ii) continue adding and mixing into said dissolved thermoplastic elastomer, propellant solids including aluminum powder as a fuel element and two different nominal particle sizes of ammonium perchlorate, as oxidizer to increase particle packing efficiency, said ammonium perchlorate having a small amount of water in the form of a very thin film on the particles surfaces;

(iii) continue mixing said solids in said thermoplastic elastomer solution to achieve a uniform mixture of said composite propellant composition;

(iv) evaporating said organic solvent from said composite propellant composition to yield a dry solid composite propellant composition free from said volatile organic solvent;

(v) chopping said dried solid composite propellant composition into pellets;

(vi) placing a predetermined amount of said pellets in a mold and heating to 130° C. to yield a viscous fluid of said solid composite propellant composition;

(vii) pressing said viscous fluid in said mold; and,

(viii) cooling said mold and releasing from said mold a formed solid composite propellant grain.

4,597,925

METHOD OF CONSTRUCTING A MODULAR REINFORCED BUILDING STRUCTURE

Albert D. Loggy, Portoviejo 442 Y Versalles, Quito, Ecuador

Filed Jul. 5, 1985, Ser. No. 752,033
Int. Cl.[4] E04B 1/16
U.S. Cl. 264—32 12 Claims

1. A method of constructing a reinforced concrete building including the steps of:

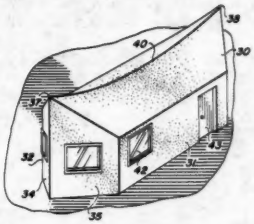
placing metal lath over an open roof framework to form the desired shape of a roof while said framework is located near the ground;

temporarily positioning roof sheeting material on the underside of said lath to provide a form against which concrete subsequently may be placed over said lath;

preparing a foundation trench around the periphery of said roof framework;

raising said roof framework to a desired final height on temporary supports;

suspending metal lath from the outer edge of said metal lath of said roof to extend downwardly into said foundation trench;



placing temporary wall sheeting material about the outside periphery of said suspended metal lath between the ground and the point where said suspended lath is affixed to said metal lath of said roof;

pouring concrete into said foundation trench;

applying concrete to said suspended lath against said temporary wall sheeting material; and

applying concrete to said metal lath of said roof against said roof sheeting material; and

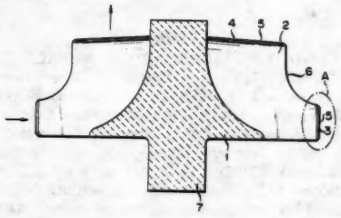
removing said wall and roof sheeting material, said temporary supports and said roof open framework.

4,597,926

METHOD OF MANUFACTURING RADIAL FLOW TURBINE ROTOR

Akio Ando, Kawasaki; Toshihiko Ochiai, Yokosuka; Masae Nakanishi, Chigasaki; Shozo Kawasaki, and Katsutoshi Nishida, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Division of Ser. No. 430,000, Sep. 30, 1982, abandoned. This application Mar. 13, 1985, Ser. No. 711,092
Claims priority, application Japan, Nov. 30, 1981, 56-190597
Int. Cl.[4] C04B 35/64
U.S. Cl. 264—67 5 Claims



1. A method of manufacturing a radial flow turbine rotor for a radial flow turbine of the type having a casing defining inlet and outlet fluid passageways, said method comprising the steps of injection molding a rotor body including a conical shaft and a plurality of blades formed on the periphery of said shaft and at an angle to the axis of said shaft from a ceramic material using a mold having parting lines corresponding to edges of the blades, allowing projections to be formed on the blade edges corresponding to the mold parting lines, sintering the molding thus obtained, and grinding the edge surfaces of said blades to remove only those portions of the formed projections to be placed adjacent the casing thereby leaving other portions of the formed projections to be placed in confronting relationship to the inlet and outlet passageways.

4,597,927

TWO-STAGE PROCESS FOR THE PREPARATION OF THERMOPLASTIC POLYURETHANE ELASTOMERS

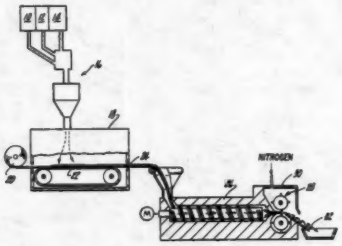
Gerhard Zeitler, Hessheim; Frank Werner, Neustadt; Gerhard Bittner, Diepholz; Karl-Heinz Baumann, Battenberg; Artur Roeber, Ludwigshafen; Lothar Metzinger, Osnabrück; Rainer Ohlinger, Heidelberg, and Hans D. Zettler, Grünstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 16, 1983, Ser. No. 504,795

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1982, 3224324

Int. Cl.[4] B29C *47/00, 71/00;* B02C *18/14, 23/24*

U.S. Cl. 264—85 8 Claims



1. A process for the preparation of thermoplastic polyurethane elastomers by reacting

(a) organic diisocyanates,

(b) polyhydroxyl compounds with molecular weights of 500 to 8000 and

(c) chain extenders with molecular weights of 60 to 400 in the presence of

(d) catalysts at temperatures from 60° C. to 250® C. wherein the reaction is carried out in two stages with the first reaction stage consisting of mixing components (a) through (d) continuously, applying the reaction mixture to a thermoplastic foil covered conveyor band and allowing it to react until it solidifies and subsequently in a second reaction stage melting in an extruder the solidified reaction mixture together with the thermoplastic foil while completing the reaction and subsequently extruding and granulating said melt.

4,597,928

METHOD FOR FIBERBOARD MANUFACTURE

Otto A. Terentiev, Leningrad; Anatoly V. Burov, Leningradskaya; Ekaterina Y. Vorobieva; Ekaterina I. Grudinka, both of Trakaisky; Gennady T. Nesterchuk; Oleg I. Shapovalov, both of Leningrad; Khamdam U. Usmanov, Tashkent; Shavkat M. Mirkamilov, Tashkent; Tolkun M. Mirkamilov, Tashkent, and Vladimir V. Sharkov, Leningrad, all of U.S.S.R., assignors to Leningradsky Tekhnologichesky Institute Tselljulozno-Bumazhnoi Promyshlennosti and Proizvodstvennoe Obiedinenie "Litbumprom", both of Leningrad, U.S.S.R.

Filed Mar. 23, 1984, Ser. No. 593,031

Int. Cl.[4] B29C *41/28*

U.S. Cl. 264—87 1 Claim

1. A method for fiberboard manufacture comprising the steps of steaming and grinding woodchips to obtain a wood pulp, using said wood pulp to prepare a slurry of wood pulp in water, mixing said slurry with a binder, a cure catalyst for the binder, a water-repellent additive, peat, and carbamide, casting the resultant mixture and dewatering said mixture to obtain a mat, and pressing said mat to obtain fiberboard which is subjected to heat treatment, the peat used having a moisture content of between 25 and 70 percent and the peat content in said mixture being between 2.5 and 50 percent by mass, with the ratio of absolutely dry peat to said binder equal to between 1.0–7:1.0, respectively, while the carbamide content in said mixture is between 0.2 and 2.0 percent by mass, with the ratio of said carbamide to said binder equal to between 0.02–1:1, respectively, said slurry being having a pH of about 5 and said binder being insoluble is water after cure.

4,597,929

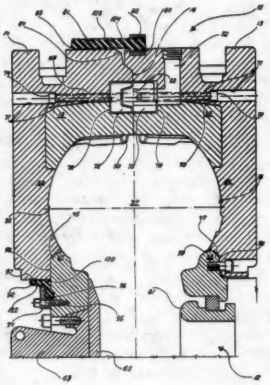
METHOD FOR VENTLESS TIRE MOLDING AND TIRE RESULTING THEREFROM

Jerome J. Blayne, Brecksville, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Nov. 23, 1984, Ser. No. 674,396

Int. Cl.[4] B29D *30/06*

U.S. Cl. 264—102 12 Claims



1. In a process wherein a green tire having tread, sidewall and bead portions is formed and then molded under internal pressure within a tire mold having tread, sidewall and bead components defining a mold cavity, with at least one bead component being moveable relative to a sidewall component of one of the mold sections, each of said components having essentially no venting aperatures for venting from the mold cavity to a point external to the mold, and including a circumferential parting line dividing the mold into at least two sections, one such section being moveable away from the other, the improvement comprising forming a cured tire essentially free of protruding sidewall, bead, and tread vents while avoiding formation of a light tire by the steps of:

providing at least one point of communication with a conduit means along the parting line radially outwardly of the tread components interruptably joined to a source of vacuum;

placing the green tire within the mold cavity;

thereafter closing the mold until the mold sections are spaced apart by not more than about 5.08 centimeters and not less than about 0.10 centimeters along the parting line;

circumferentially sealing the parting line of the spaced apart mold sections radially outwardly of the conduit means point of communication whereby movement of air into the mold cavity along the parting line is substantially precluded, and sealingly closing any other pathways by which air may enter the mold cavity to substantially preclude the movement of air into the mold cavity including providing a seal configured to substantially preclude the movement of air into the mold between the moveable bead and sidewall components at least while evacuation of the mold cavity is accomplished;

applying the source of vacuum to the conduit means after said sealing whereby the mold is evacuated to an obsolute

pressure not exceeding 16932 Pa in not more than about 60 seconds;

closing the evacuated mold; and

curing the tire.

4,597,930

METHOD OF MANUFACTURE OF A FELTED FIBROUS PRODUCT FROM A NONAQUEOUS MEDIUM

John R. Szal, 2 Larisa Ter., Ormond Beach, Fla. 32074

Filed Jul. 11, 1983, Ser. No. 512,443

Int. Cl.⁴ D21J *5/26*; D04H *1/00*

U.S. Cl. 264—115 **25 Claims**

1. An improvement in a method of manufacturing felted fibrous product including the steps of reducing cellulosic material into fibers, said improvement consisting the steps of:

dispersing said fiber and a substance containing a radical in air, which substance includes a nitrogen atom and at least two hydrogen atoms,

injecting said substance in gaseous phase;

ionizing said substance by steam injection while in gaseous phase;

hydrating said fibers while in air suspension in preparation for formation of hydrogen bonds at interfibrile contact points; and

air laying said fibers while hydrated to form a fibrous mat defining interfibrile contact points among said fibers,

whereby hydrogen bonds are formed at said interfibrile contact points during said step of air laying, said fibrous mat produced thereby being adaptable for further processing to form said felted fibrous product.

4,597,931

METHOD OF MANUFACTURING A WINDSHIELD HAVING A COATING OF VARYING THICKNESS

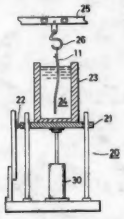
Masaki Watanabe, Saitama; Akio Yagasaki, Tokyo; Toru Murayama, Saitama, and Kazuya Yonekura, Gunma, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1983, Ser. No. 476,758

Claims priority, application Japan, Mar. 19, 1982, 57-42884

Int. Cl.⁴ B29D *11/00*; B05C *3/00*; B05D *1/18*; B32B *27/36*

U.S. Cl. 264—129 **4 Claims**



1. A method of manufacturing a windshield comprising the steps of; molding a windshield base having a predetermined shape from a resin material, suspending said base above said liquid coating bath and raising said bath to said base to immerse said base in said coating liquid, and withdrawing said base from said liquid coating bath at a predetermined variable rate of speed to provide a coating on said base of varying thickness, by sensing the vertical position of said bath once said base has been immersed to a predetermined depth, and lowering said bath away from said base at a predetermined selected speed to provide said coating of varying thickness.

4,597,932

METHOD OF MANUFACTURING SYNTHETIC RESIN PEN NIBS

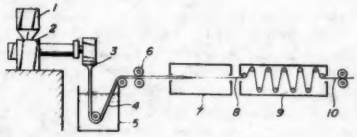
Norigi Kurihara, Yachio, and Ryutaro Sakuda, Tokyo, both of Japan, assignors to Aubex Corporation, Tokyo, Japan

Filed Jun. 25, 1984, Ser. No. 624,003

Claims priority, application Japan, Jun. 27, 1983, 58-114372

Int. Cl.⁴ B29C *47/90*

U.S. Cl. 264—145 **11 Claims**



1. A method of manufacturing synthetic resin pen nibs, which comprises:

extruding a molten thermoplastic crystalline synthetic resin from a molding die with a suitable orifice shape, and forming said synthetic resin into a continuous rod of desired cross-sectional shape by rapid cooling to place the resin in as amorphous a state as possible;

forming a monofilamentous core with capillaries by stretching said rod axially under a suitable temperature condition lying within a range that extends from the glass transition point to the softening point of said synthetic resin, while at the same time reducing the rod diameter to achieve oriented crystallization of the synthetic resin molecules;

heat-treating said monofilamentous core such as to cause the growth of non-oriented fine crystals between said oriented crystals and accelerate crystallization of the synthetic resin molecules, to thereby form a mixed crystal structure essentially consisting of oriented crystals, non-oriented fine crystals dispersed and grown between said oriented crystals, and remaining amorphous regions; and

cutting the heat-treated monofilamentous core into rod-like cores of desired length and shaping at least one end of each rod-like core into appropriate writing tip configuration.

4,597,933

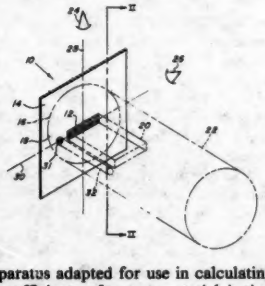
RADIATIVE OPACITY AND EMISSIVITY MEASURING DEVICE

Barrett H. Ripin, Silver Spring, and Robert R. Whitlock, College Park, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 1, 1983, Ser. No. 500,127

Int. Cl.⁴ G01T *1/36*

U.S. Cl. 376—153 **56 Claims**



1. An apparatus adapted for use in calculating opacity and emissivity coefficients of a test material ionized into a test plasma comprising:

first means for forming a test plasma from a test material which emits test photons;

second means for forming a carrier plasma laterally surrounding said test plasma for collisionally confining said test plasma and serving as a thermodynamic bath around said test plasma so that nearly uniform cross-sectional temperature and density of the test plasma is obtained; and

third means for measuring intensity of test photons traversing said test plasma and said carrier plasma.

44. A method adapted for use in calculating opacity and emissivity coefficients of a test plasma, the method comprising the steps of:

providing a target including a support structure of a carrier material with an asymmetrically shaped sample of a test material disposed theron, said asymmetrically shaped test sample having a thin axis and a thick axis;

ionizing said target into a test plasma for emitting test photons and a carrier plasma laterally surrounding said test plasma for reducing temperature and density gradients of said test plasma; and

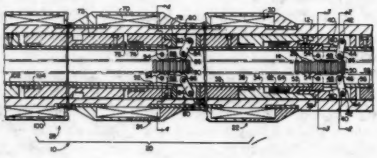
using a first spectrograph for measuring the intensity of said test photons.

4,597,934

MULTI-FUNCTION MAGNETIC JACK CONTROL DRIVE MECHANISM

Lawrence R. Bollinger, Schenectady, and Donald C. Crawford, Scotia, both of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 6, 1983, Ser. No. 539,370
Int. Cl.[4] G21C *7/12, 7/18*
U.S. Cl. 376—235 **9 Claims**



1. A multi-function magnetic jack control drive mechanism for controlling a nuclear reactor comprising:

an elongate pressure housing;

a plurality of closely-spaced drive rods located in said pressure housing, each said drive rod being connected to a reactor rod which is insertable in a reactor core;

a plurality of electromechanical stationary latch means which are selectively actuatable for holding a respective one of said drive rods stationary with respect to said pressure housing, said plurality of stationary latch means including at least one coil located about said pressure housing;

a plurality of longitudinally spaced electromechanical movable latch means, individually associated with one of said drive rods and each including a base for the drive rod associated therewith, for, when actuated, holding the associated drive rod stationary with respect to the base associated therewith, each said movable latch means including an associated coil located about said pressure housing; and

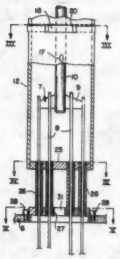
a plurality of longitudinally spaced electromechanical lift means, individually associated with each said base, for, when actuated, moving an associated base longitudinally along said pressure housing from a first position to a second position to thereby enable movement of one or more of said other drive rods longitudinally independently of said other drive rods in response to sequential and repeated operation of said electromechanical means, each said lift means including an associated coil located about said pressure housing.

4,597,935

NUCLEAR REACTOR HAVING A CONTROL CLUSTER GUIDE

Jean-Jacques Verdeau, Gif-sur-Yvette, and Michel R. Le Helloco, Paris, both of France, assignors to Framatome & Cie, Courbevoie, France

Continuation of Ser. No. 353,996, Mar. 2, 1982, abandoned. This application Apr. 2, 1985, Ser. No. 718,205
Claims priority, application France, Mar. 13, 1981, 81 05037
Int. Cl.[4] G21C *7/10*
U.S. Cl. 376—353 **4 Claims**



1. A water moderated and cooled nuclear reactor including clusters for control of reactivity, each formed of a plurality of absorbent pencils (8) movable vertically through a core plate (6) forming the upper boundary of a core of said reactor and connected together by a spider (7) having arms radial to a common axial operating rod (10), and means outside said core for guidance of said control clusters during their movements, said means comprising guide housings (12) each associated with a respective one of said control clusters and each having internal plates which assure discontinuous and individual guidance at intermediate levels for said pencils and said spider, each of said housings (12) being associated with tubes (26) devoid of side openings for continuous guidance of the individual pencils, said tubes (26) being each connected to an individual pair of two tube plates (25, 27) enabling passage of said pencils (8), one (25) of said tube plates constituting a lower closure plate for said housing and the other (27) of said tube plates being independent of the other plates of the other pairs and forming a positioning flange with respect to said core plate and being formed with outlet openings (31) for the passage of water leaving said reactor core through said core plate.

4,597,936

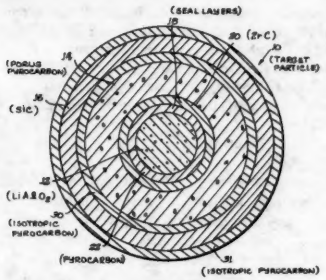
LITHIUM-CONTAINING NEUTRON TARGET PARTICLE

James L. Kaae, Solana Beach, Calif., assignor to GA Technologies Inc., San Diego, Calif.

Filed Oct. 12, 1983, Ser. No. 541,126
Int. Cl.[4] G21C *3/00*
U.S. Cl. 376—411 **20 Claims**

1. A neutron target particle for breeding tritium comprising a central generally spherical core formed of a lithium-containing compound which is stable under coating conditions and conditions within the core of a nuclear reactor, a pyrocarbon seal layer covering said core,

a zirconium carbide seal layer covering said pyrocarbon seal layer,



a porous pyrocarbon buffer layer surrounding said seal layers, and

a silicon carbide coating surrounding said buffer layer.

4,597,937

FUEL SPACER

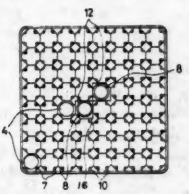
Mikio Sakurai, 2274-38, Senba-cho, Mito-shi, Ibaraki-ken; Koki Yamauchi, Shigakuryo, 4-11-1, Johnan-cho, and Shuji Suzuki, Shimohararyo, 4-3-17, Ayukawa-cho, both of Hitachi-shi, Ibaraki-ken, all of Japan

Filed Jul. 8, 1983, Ser. No. 511,905

Claims priority, application Japan, Jul. 9, 1982, 57-119627

Int. Cl.[4] G21C *3/34*

U.S. Cl. 376—441 **24 Claims**



1. An independent cell type fuel spacer for a nuclear reactor having a plurality of fuel rods and a water rod having a locking projection, comprising:

a plurality of independent cells for surrounding fuel rods, each of which fuel rod-surrounding independent cells being composed of a thin sheet cross-sectionally extending along an outer surface of a fuel rod;

an independent cell for surrounding a water rod, which water rod-surrounding independent cell is of a different cross-sectional shape than said fuel rod-surrounding independent cells, disposed among a plurality of said fuel rod-surrounding independent cells, made of a thin sheet cross-sectionally extending so as to form at least one substantially right-angled corner portion and forming means to allow water rod to pass therethrough only when the locking projection provided on the water rod is positioned in said right-angled corner portion of said water rod-surrounding independent cell, said water rod-surrounding independent cell having a plurality of planar surfaces exhibiting exterior transverse widths along the directions of said surfaces substantially equal in value to the least exterior transverse distance between geometrically opposite sides of said fuel rod-surrounding independent cells and providing greater interior cross-sectional area for the water rod than is provided by any of said fuel rod-surrounding independent cells for said fuel rods;

means for causing said water rod to directly engage interior surfaces of said water rod-surrounding independent cell; and

means for connecting all of said fuel rod-surrounding independent cells and water rod-surrounding independent cell in a lattice type arrangement in such a manner that each of said cells is connected to adjacent cells;

whereby the outer diameter of a water rod to be inserted into said water rod-surrounding independent cells may be greater than the outer diameter of said fuel rods.

4. An independent cell type fuel spacer for a nuclear reactor having a plurality of fuel rods and a water rod having a locking projection, comprising:

a plurality of independent cells for surrounding fuel rods, each of which fuel rod-surrounding independent cells is composed of a thin sheet cross-sectionally extending along an outer surface of a fuel rod;

an independent cell for surrounding a water rod, which water rod-surrounding independent cell has a different cross-sectional shape than the fuel rod-surrounding independent cells for fuel rods, a larger cross-sectional dimension permitting at least one locking projection provided on the water rod to pass therethrough, and a smaller cross-sectional dimension permitting engagement with the locking projection after rotation of the water rod, said water rod-surrounding independent cell having a plurality of planar surfaces exhibiting exterior transverse widths along the directions of said surfaces being substantially equal in value to the least exterior transverse distance between geometrically opposite sides of said fuel rod-surrounding independent cells and providing greater interior cross-sectional area for the water rod than is provided by any of said fuel rod-surrounding independent cells for the fuel rods;

means for causing said water rod to directly engage interior surfaces of said water rod-surrounding independent cell;

means for connecting all of said fuel rod-surrounding cells and water rod-surrounding cell in a lattice type arrangement in such a manner that each of said cells is connected to adjacent cells;

whereby the outer diameter of a water rod to be inserted into said water rod surrounding independent cells may be greater than the outer diameter of said fuel rods.

19. An independent cell type fuel spacer for a nuclear reactor having a plurality of fuel rods and a water rod having a locking projection, comprising:

a plurality of independent cells for surrounding fuel rods, each of which fuel rod-surrounding independent cells being composed of a thin sheet cross-sectionally extending along an outer surface of a fuel rod;

an independent cell for surrounding a water rod, which water rod-surrounding independent cell is of a different cross-sectional shape than said fuel rod-surrounding independent cells, disposed among a plurality of waid fuel rod-surrounding independent cells, made of a thin sheet cross-sectionally extending so as to form at least one substantially right-angled corner portion and forming means to allow the water rod to pass therethrough only when the locking projection on the water rod is positioned in said right-angled corner portion of said water rod-surrounding independent cell, said water rod-surrounding independent cell having a plurality of planar surfaces exhibiting exterior transverse widths along the directions of said surfaces substantially equal in value to the least exterior transverse distance between geometrically opposite sides of said fuel rod-surrounding independent cells and providing greater interior cross-sectional area for the water rod than is provided by any of said fuel rod-surrounding independent cells for said fuel rods;

said water rod-surrounding independent cell having at least four sides, two of said four sides being planar, forming said substantially right-angled corner portion, and directly engaging a water rod insertable into said water rod-surrounding independent cell, and means for causing said water rod to directly engage said two planar sides; and

means for connecting all of said fuel rod-surrounding independent cells and water rod-surrounding independent cell in a lattice type arrangement in such a manner that each of said cells is connected to adjacent cells;

whereby the outer diameter of a water rod to be inserted into said water-rod surrounding independent cells may be greater than the outer diameter of said fuel rods.

22. An independent cell type fuel spacer for a nuclear reactor having a plurality of fuel rods and a water rod having a locking projection, comprising:

a plurality of independent cells for surrounding fuel rods, each of which fuel rod-surrounding independent cells is composed of a thin sheet cross-sectionally extending along an outer surface of a fuel rod;

an independent cell for surrounding a water rod, which water rod-surrounding independent cell has a different cross-sectional shape than the fuel rod-surrounding independent cells for fuel rods, a larger cross-sectional dimension permitting at least one locking projection provided on the water rod to pass therethrough, and a smaller cross-sectional dimension permitting engagement with the locking projection after rotation of the water rod, said water rod-surrounding independent cell having a plurality of planar surfaces exhibiting exterior transverse widths along the directions of said surfaces substantially equal in value to the least exterior transverse distance between geometrically opposite sides of said fuel rod-surrounding independent cell and providing greater interior cross-sectional area for the water rod than is provided by any of said fuel rod-surrounding independent cells for the fuel rods;

said water rod-surrounding independent cell having at least four sides, two of said four sides being planar, forming said subtantially right-angled corner portion, and directly engaging a water rod insertable into said water rod-surrounding independent cell, and means for causing said water rod to directly engage said two planar sides; and

means for connecting all of said fuel rod-surrounding cells and water rod-surrounding cell in a lattice type arrangement in such a manner that each of said cells is connected to adjacent cells;

whereby the outer chamber of a water rod to be inserted into said water-rod surrounding independent cells may be greater than the outer diameter of said fuel rods.

4,597,938

PROCESS FOR PRODUCING PERMANENT MAGNET MATERIALS

Yutaka Matsuura, Ibaraki; Masato Sagawa, Nagaokakyo, and Setsuo Fujimura, Kyoto, all of Japan, assignors to Sumitomo Special Metals Co., Ltd., Osaka, Japan

Filed Sep. 15, 1983, Ser. No. 532,517

Claims priority, application Japan, May 21, 1983, 58-88372; May 21, 1983, 58-88373; May 24, 1983, 58-90038; May 24, 1983, 58-90039

Int. Cl.[4] B22F *3/16*; C22C *33/02, 38/32*

U.S. Cl. 419—23 **32 Claims**

1. A process for producing permanent magnet materials of the Fe-B-R type comprising:

preparing a metallic powder having a mean particle size of 0.3–80 microns and a composition consisting essentially of by atomic percent, 12–24% R wherein R is at least one rare earth element selected from the group consisting of Nd, Pr, La, Ce, Tb, Dy, Ho, Er, Eu, Sm, Gd, Pm, Tm, Yb, Lu and Y and at least 50% of R consists of Nd and/or Pr, 4–24 % B, and at least 52% Fe,

compacting said metallic powder, and

sintering the resultant body at a temperature of 900–1200 degrees C. in a nonoxidizing or reducing atmosphere.

4,597,939

SPRAY POWDER FOR PRODUCING WEAR RESISTANT COATINGS

Hans J. Neuhäuser, Bergisch Gladbach; Ulrich Buran, Burscheid; Manfred Fischer, Leichlingen, and Horst Beyer, Burscheid, all of Fed. Rep. of Germany, assignors to Goetze AG, Burscheid, Fed. Rep. of Germany

Filed Dec. 20, 1983, Ser. No. 563,460

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1982, 3247054

Int. Cl.[4] C23C *7/00*

U.S. Cl. 420—429 **6 Claims**

1. Spray powder for the production of wear resistant coatings on the bearing and friction faces of machine parts subjected to sliding friction, the spray powder consisting essentially of the following components:

20 to 60 weight percent molybdenum,

20 to 50 weight percent molybdenum carbide and

3 to 30 weight percent of a low melting point alloy, wherein said low melting point alloy is at least one alloy selected from the group consisting of chromium alloys, chromium-nickel alloys, and aluminum alloys.

4,597,940

PRESERVATIVE TREATMENT OF WOOD

Bror O. Häger, Forsetevagen 5, S-182 63 Djursholm, Sweden

Filed Feb. 5, 1985, Ser. No. 698,411

Claims priority, application Sweden, Feb. 6, 1984, 8400584

Int. Cl.[4] A61L *9/04*

U.S. Cl. 422—32 **15 Claims**

1. A method for protecting cellulosic products selected from the group consisting of moist wood, paper, pulp, chips, fibers, and other organic cellulosic products against damage from microorganisms including fungi, said method comprising a step of introducing an evaporable ammonium salt of a weak acid into a limited space in which said products are stored and allowing it to evaporate to provide a protective atmosphere against the microorganisms.

12. A method for protecting cellulosic products selected from the group consisting of moist wood, paper, chips, fibers, and other organic cellulosic products stored in a pile against damage from microorganisms including fungi, said method comprising a step of introducing an evaporable ammonium salt of a weak acid into said pile and allowing it to evaporate to form ammonia and to provide a protective atmosphere comprising ammonia against the microorganisms.

4,597,941

TOILET CLEANING ARTICLE AND METHOD FOR CODISPENSING DISINFECTANT AND DYE HAVING RESISTANCE TO SPECTRAL DEGRADATION

Carey B. Bottom, West Chester; Jane F. Gilmore, Fairfield, and John L. Martin, Jr., Cincinnati, all of Ohio, assignors to The Drackett Company, Cincinnati, Ohio

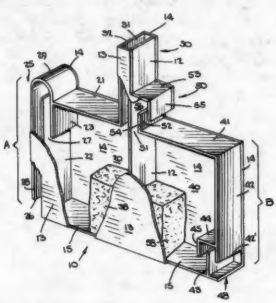
Filed Mar. 28, 1984, Ser. No. 594,153

Int. Cl.[4] A01N *29/00*; E03D *9/02*

U.S. Cl. 422—37 **34 Claims**

1. A method of cleaning a toilet having a tank and a bowl with a hypohalite disinfectant agent each time the tank is flushed, and providing the bowl water with a dye resistant to attack by the disinfectant agent, said method comprising the step of codispensing from separate product chambers into the tank water for retention in the bowl water a first solution containing a hypohalite ion releasing agent selected from the group consisting of 1,3-dibromo-5,5-dimethylhydantoin, 1,3-dichloro-5,5-dimethylhydantoin, 1-bromo-3-chloro-5,5-dimethylhydantoin, dichloroisocyanuric acid and its potassium and sodium salts, and trichloroisocyanuric acid, and a second solution containing a dye which is Colour Index Dye No. 52,035, the concentration of hypohalite ions in the bowl water after a

flush being from about 2 to about 15 ppm available chlorine and the concentration of the dye on an active basis being from



about 0.1 to about 5.0 ppm, the weight ratio of available chlorine to active dye being from about 1:1 to about 20:1.

4,597,942

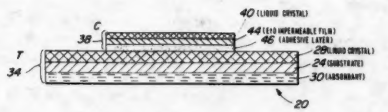
DEVICE TO INDICATE THE CONCENTRATION OF ETHYLENE OXIDE IN THE WORKPLACE

William G. Meathrel, Gananoque, Canada, assignor to Graphic Controls Canada Ltd., Ganonoque, Canada

Continuation-in-part of Ser. No. 497,807, May 25, 1983. This application Aug. 15, 1983, Ser. No. 523,050

Int. Cl.[4] G01N *21/78*

U.S. Cl. 422—57 **11 Claims**



1. A dosimeter for providing a contemporaneous, on-going visual indication of the total cumulative concentration of ethylene oxide to which a wearer of said dosimeter has been exposed, said dosimeter comprising,

first sensor means responsive to ethylene oxide for enabling a continuous determination of the current concentration of ethylene oxide in an ambient environment,

said first sensor means constituting a control reference area,

gas-absorbing means for extracting, absorbing, retaining and cumulatively integrating ethylene oxide gas concentration present in an ambient environment,

second sensor means in gas-sensing communication with said gas-absorbing means for reacting with ethylene oxide gas absorbed in and concentrated by said gas-absorbing means to permit a cumulative, quantitiative determination of total gas absorbed by said gas-absorbing means, and to indicate a wearer's total exposure to ethylene oxide over a time-weighted average,

said first and said second sensor means comprising liquid crystal compositions which exhibit color changes when exposed to ethylene oxide gas and siad first sensor means and said second sensor means being responsive to undergo color changes upon exposure to ethylene oxide whereby temperature effects between the two sensor means are cancelled, and wherein differences in color between said first sensor means and said second sensor means provide a quantitative indication of a concentration of ethylene oxide to which said dosimeter has been exposed.

4,597,943

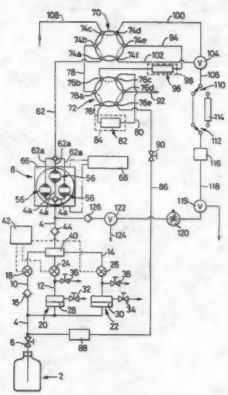
APPARATUS FOR ANALYZING SOLID SAMPLE WITH SUPERCRITICAL FLUID

Kenkichi Sugiyama, Yokohama; Muneo Saito, and Akio Wada, both of Hachioji, all of Japan, assignors to Morinaga & Co., Ltd., Tokyo and Japan Spectroscopic Co., Ltd., Hachioji, both of, Japan

Filed Nov. 29, 1984, Ser. No. 676,200

Int. Cl.[4] G01N *1/22*

U.S. Cl. 422—70 **8 Claims**



1. An apparatus for analyzing a solid sample with a supercritical fluid comprising:

a fluid container containing as an extraction solvent a fluid obtained by compressing and liquefying a substance which is a gas at ambient temperature and atmospheric pressure;

a pump of a reciprocating plunger type for drawing said fluid from said fluid container through a suction line and delivering it through a delivery line;

means for cooling a pump head portion of said pump to prevent gasification of said fluid;

extraction means for bringing said fluid supplied through said delivery line into contact with the sample, in a supercritical state, to extract at least one component from said sample;

trapping means provided downstream of said extraction means for collecting said at least one component from said fluid; and

a chromatograph which can be connected to said trapping means by changeover valve means and which comprises a separating column, distinct from said trapping means for separating said at least one collected component from each other if said at least one component is at least two components, and comprises a detector for detecting said at least one component, said chromatograph further comprising means for passing said at least one component from said trapping means directly to said detector if said at least one component is only one component.

8. An apparatus for analyzing a sample with a supercritical fluid, comprising:

a fluid container containing as an extraction solvent a fluid obtained by compressing and liquefying a substance which is a gas at ambient temperature and atmospheric pressure;

pump means for drawing said fluid from said fluid container through a suction line and delivering it through a delivery line, said suction line having a passage portion consisting of at least two branch lines, one of said branch lines defining a passageway for said fluid while the other branch line has a solvent tank containing an entrainer assisting said extraction, said solvent tank being divided into two chambers by a movable or deformable partition, one of said two chambers containing said entrainer, while said fluid flows

into the other chamber to exert pressure on said partition to force said entrainer out of said one chamber, said one branch line having a valve, while another valve is provided on said other branch line downstream of said solvent tank, said valves being operable to supply said fluid and said entrainer in a predetermined proportion so that a mixture of said fluid and said entrainer may be supplied to said pump means;

means for cooling pump heads of said pump means;

extraction means for bringing the fluid supplied through said delivery line into contact with the sample, in a supercritical state, to extract at least one component from said sample;

trapping means provided downstream of said extraction means for collecting said at least one component from said fluid; and

analyzing means which can be connected to said trapping means by changeover valve means for analyzing said collected component from said trapping means.

4,597,944

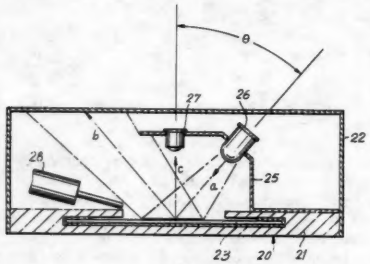
AGGLUTINATION REAGENT DETECTION SYSTEM

Hugh V. Cottingham, 49 Mountain Ave., Caldwell, N.J. 07006

Filed Oct. 18, 1983, Ser. No. 542,846

Int. Cl.[4] G01N *21/49, 33/48*

U.S. Cl. 422—73 **14 Claims**



1. A reagent detection system for detecting a particulate agglutination reaction in an reagent comprising, in combination, sample field means for receiving a particulate liquid agglutination reagent and defining a liquid isoplanar sample field, light means for directing light towards said liquid isoplanar sample field, and detection means cooperating with said light means for instantaneously detecting a change in the amount of light scattered from said liquid isoplanar sample field caused by the agglutination reaction by summing light scattered from substantially all particles in the sample field and in response thereto for producing a display signal that is substantially linearly related to the surface area of the particles as modified by agglutination.

4,597,945

STERILIZATION APPARATUS

Ko Sugisawa; Kazuya Sekiguchi; Kiyoaki Tsuzi, and Akinobu Ono, all of Higashiosaka, Japan, assignors to House Food Industrial Company Limited, Osaka, Japan

Filed Mar. 8, 1984, Ser. No. 587,368

Claims priority, application Japan, Mar. 9, 1983, 58-39705; Mar. 18, 1983, 58-46887; Mar. 28, 1983, 58-54916; Sep. 29, 1983, 58-183469

Int. Cl.[4] G05D *16/00*

U.S. Cl. 422—113 **11 Claims**

1. A sterilization apparatus for continuously sterilizing materials to be treated containing solid particles therein while keeping a pressure of said apparatus unchanged, comprising:

(a) a sterilizer means for sterilizing material and for passing therethrough solid particles;

(b) a feeding device means for feeding materials to be treated to said sterilizer means;

(c) a backpressure tank means for supplying a backpressure to said sterilizer means said back pressure tank means comprising means for controlling air pressure therein;

(d) a feed pipe connecting said sterilizer means to said backpressure tank means;

(e) an auxiliary backpressure pipe branching from said feed;

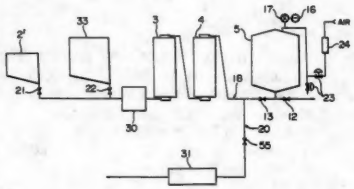
(f) a backpressure device means provided in said auxiliary backpressure pipe, for supplying a backpressure to said sterilizer means so that the pressure in said sterilizer means is unchanged and for passing therefrom said solid particles; and

(g) valve means positioned so as to operatively open and close communications between said sterilizer means and backpressure tank means and between said sterilizer means and said backpressure device means.

10. A sterilization apparatus for continuously sterilizing materials to be treated having solid particles therein, while keeping pressure in said apparatus unchanged, comprising:

(a) a sterilizer means for passing therethrough solid particles;

(b) a feeding device means for feeding materials to be treated into said sterilizer means;



(c) an aseptic tank means provided downstream of said sterilizer means for supplying back pressure to said sterilizer means, said aseptic tank means comprising means for controlling air pressure therein;

(d) a feed pipe connecting said sterilizer means to said aseptic tank means;

(e) an auxiliary backpressure pipe branching from said feed pipe;

(f) a backpressure pump means provided in said auxiliary backpressure pipe;

(g) a cooler means for cooling material and for passing therethrough said solid particles, said cooler means being provided in said auxiliary backpressure pipe; and

(h) valve means positioned so as to operatively open and close communications between said sterilizer means and said aseptic tank means and between said sterilizer means and said backpressure pump means,

a combination whereby said feeding device means and one of said aseptic tank means said backpressure pump means are arranged so as to operatively supply backpressure to said sterilizer so that air pressure therein remains unchanged.

4,597,946

VERTICAL TUBE REACTOR WITH SERIAL DOWNWARD FLOW THROUGH A PLURALITY OF SETS OF PARTICULATE CONTAINING TUBES

Dennis J. Ward, South Barrington, Ill., assignor to UOP Inc., Des Plaines, Ill.

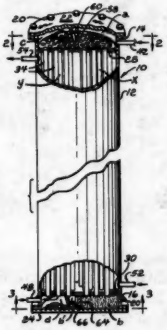
Filed Apr. 30, 1985, Ser. No. 728,969

Int. Cl.[4] B01J *8/04, 8/06;* **B23K** *31/02*

U.S. Cl. 422—190 **4 Claims**

1. In a reaction vessel having particulate contact material contained in a large plurality of vertical tubes positioned therein, and means permitting ingress of fluid to the upper ends of said contact material containing tubes for the downward flow of a fluid therethrough, said plurality of tubes being

located parallel to each other within said vessel and having their ends mounted in upper and lower tube sheets which are mounted adjacent the ends of said vessel and sealed thereto so as to define upper and lower chambers positioned respectively above and below said upper and lower tube sheets through which fluid may flow, the improvement comprising at least one upper vertical partition member mounted in said upper chamber and at least one vertical partition member mounted in said lower chamber, at least one of said at least one vertical partition members in said upper chamber being in at least general vertical alignment with said at least one vertical partition in said lower chamber and dividing each of said chambers into isolated compartments which each contain the open ends of a plurality of tubes; said at least one vertical partition in said lower chamber including a flow port and an extension portion from a first compartment which extends into an adjacent compartment where it surrounds and communicates with the open end of at least one additional tube in said adjacent compartment but is sealed relative to the remainder of the tubes in said adjacent compartment; said at least one additional tube being open and substantially devoid of particulate contact material, thereby permitting fluid passing downwardly under pressure through the contact material containing tubes whose open lower ends are in said first compartment to be forced upwardly through said at least one additional tube, and into the upper chamber in a compartment portion thereof which vertically overlies said at least one additional tube and said adjacent



compartment in said lower chamber, from where it can pass downwardly through the plurality of contact material containing tubes whose open lower ends terminate in said adjacent compartment.

4. A method of increasing the velocity of flow of a reactant fluid in a downward direction in a vessel containing upper and lower tube sheets and through a plurality of tubes sealed in said tube sheets which contain particulate contact material and whose upper and lower ends all terminate in common upper and lower chambers located respectively above and below said upper and lower tube sheets, said method comprising the steps of attaching at least one vertical partition member to said upper and lower tube sheets so as to partition each of the upper and lower chambers into at least first and second adjacent compartments which are at least generally superposed in vertical alignment and joined by a plurality of the particulate material containing tubes mounted in said tube sheets; forming a screened port in said at least one vertical partition in the lower chamber and extending the walls of said at least one lower vertical partition into said second adjacent compartment in said lower chamber so as to surround at least one additional tube therein and isolate its lower end from the remainder of the tubes in said second compartment, said at least one additional tube being devoid of particulate material and serving as a conduit to carry fluid which has passed through a plurality of particulate filled tubes from the first upper compartment to the first lower compartment, to the upper ends of the particulate filled tubes which are in the second compartment.

4,597,947

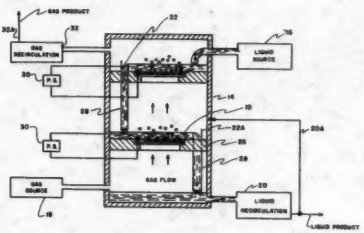
MASS TRANSFER AND MATERIAL SEPARATION MICROCHANNEL PLATE APPARATUS

Bipin C. Almaula, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 509,840, Jun. 30, 1983, abandoned. This application Feb. 21, 1985, Ser. No. 703,978

Int. Cl.[4] B01D *3/22;* **B01J** *10/00, 35/02*

U.S. Cl. 422—191 **3 Claims**



1. A fluid mass transfer and reaction apparatus comprising:

a distillation tower having a top portion, a bottom portion, and an inside diameter;

a plurality of plate holders mounted and vertically spaced within said tower; each plate holder having an associated downcomer;

at least one mcirochannel plate positioned substantially horizontally on each of said plate holders, each of the microchannel plates having a plurality of vertical channels therethrough, said channels having a diameter within the range of about 4 to about 100 microns, said channels having catalytic material deposited on the walls thereof;

a first fluid inlet positioned in said top portion of said tower for introducing a liquid reactant stream and a second fluid inlet positioned in said bottom portion of said tower for introducing a gaseous reactant stream; and

a first fluid outlet positioned in said bottom portion of said tower for dischagre of a liquid stream and a second fluid outlet positioned in said upper portion of said tower for discharge of a gaseous stream wherein said liquid reactant stream introduced into said first inlet flows across the top of each plate holder and its associated at least one microchannel plate and then down the downcomer associated with each plate holder and said gaseous reactant stream introduced into said second inlet flows upwardly through the tower and through the channels of each of said microchannel plates to react with said liquid reactant stream.

4,597,948

APPARATUS FOR OBTAINING SILICON FROM FLUOSILICIC ACID

Angel Sanjurjo, San Jose, Calif., assignor to SRI International, Menlo Park, Calif.

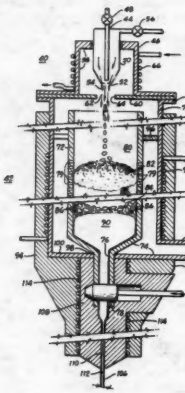
Division of Ser. No. 453,456, Dec. 27, 1982, Pat. No. 4,442,082. This application Jan. 9, 1984, Ser. No. 569,439

Int. Cl.[4] B01J *10/00, 19/26;* **C01B** *33/02;* **C22B** *61/00*

U.S. Cl. 422—199 **2 Claims**

1. A reactor for producing low cost, high purity, solar grade silicon by reaction of gaseous silicon tetrafluoride with sodium in substantially stoichiometric quantities to produce a reaction product from which silicon is recovered and wherein the silicon tetrafluoride gas used in the reaction is obtained by thermal decomposition of sodium fluosilicate, which is precipitated from aqueous fluosilicic acid generated from phosphate

rock conversion to fertilizer, said reactor comprising a reaction chamber formed of graphite , a NaF collection and dispensing chamber substantially surrounding said reaction chamber, said dispensing chamber having an outlet for said NaF, said reaction chamber configured to receive a jet spray of sodium from at least one liquid sodium inlet and silicon tetrafluoride from a silicon tetrafluoride inlet, wherein said reaction takes place inside said reaction chamber, said reaction chamber comprises an open top, a cylindrical perforated wall portion, an imperforate bottom portion and an outlet located in said bottom portion; said wall portion having perforations in the walls thereof being of such size that essentially all NaF molten reaction product freely passes out through the perforations due to the surface tension of NaF compared to silicon and molten silicon is contained within said bottom portion of said reaction chamber and removed through said outlet by free flow said perforations in said wall portion are between about 2 and 3.5 millimeters in diameter.

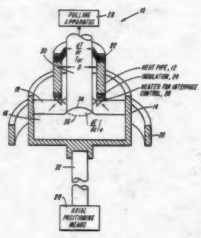


4,597,949

APPARATUS FOR GROWING CRYSTALS

Thomas J. Jasinski, Medford, and August F. Witt, Winchester, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Mar. 31, 1983, Ser. No. 481,097
Int. Cl.[4] C30B *15/14*
U.S. Cl. 422—249 **6 Claims**



1. An apparatus for improved crystal growth from a melt, wherein the crystal is pulled from a crystal-melt interface, the apparatus comprising

at least one heat pipe surrounding at least a portion of the growing crystal as it is pulled from the melt;

a temperature-adjusting element situated above and in close proximity to the crystal-melt interface, and

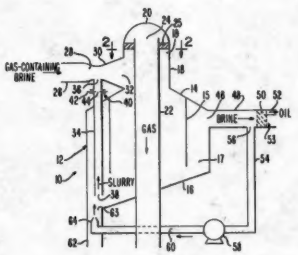
a thermal insulation element disposed between the heat pipe and the temperature-adjusting element, whereby the temperature-adjusting element is thermally insulated from, and controlled independently of, said heat pipe to affect the shape of the interface and thereby reduce the formation of interface morphology-related defects in the crystals and the heat pipe cooperates with the temperature-adjusting element to further minimize defects by maintaining the surrounded crystal in thermal equilibrium.

4,597,950

GAS SEPARATING-CRYSTALLIZER

Alfred N. Rogers, Pleasanton, and Leon Awerbuch, San Francisco, both of Calif., assignors to Bechtel International Corporation, San Francisco, Calif.

Division of Ser. No. 491,685, May 5, 1983. This application Jun. 11, 1984, Ser. No. 619,252
Int. Cl.[4] B01D *9/02*
U.S. Cl. 422—252 **1 Claim**



1. Apparatus for the separation of gases from geopressured or hydropressured brine comprising: a reactor having an upper end, a lower end and a fluid inlet, said reactor having an inlet pipe extending laterally therefrom for receiving a flow of said brine through said inlet, said reactor having a main body and a tublar extension communicating with the body and extending upwardly therefrom, said extension having a side opening defining said inlet, the opening being in a position to allow the incoming brine to enter the extension tangentially of the central axis thereof, there being an expanding nozzle coupled to said opening whereby the gases flowing into said inlet expand and are separated from the remainder of the brine by centrifugal force as a function of the movement of the brine into the reactor; a pipe centrally located in said reactor and extending from the upper end thereof to the lower end, the pipe being open near the upper end of the reactor to receive gases separated from the remainder of the brine and for directing the separated gases to a receiver; means in the reactor between the upper and lower ends thereof for dividing the remainder of the brine into a clarified liquid fraction and a slurry, said reactor having a first outlet for removing the clarified liquid fraction therefrom and a second outlet for removing the slurry therefrom; a second pipe coupled with the inlet pipe and communicating with the lower end of the reactor for directing a portion of the slurry from the reactor through said inlet, whereby the solids in the slurry portion provide nuclei for crystallization to prevent scale deposits on the inner surfaces of the reactor; and means for directing a portion of the flow of clarified liquid fraction from the first outlet to the second outlet of the reactor.

4,597,951

STRONTIUM-82/RUBIDIUM-82 GENERATOR

Gerald P. Gennaro, East Brunswick, and Paul S. Haney, Sayreville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 16, 1984, Ser. No. 641,230
Int. Cl.[4] A61K *43/00*; C22B *26/10*; C01F *11/00*
U.S. Cl. 423—2 10 Claims

1. A strontium-82/rubidium-82 generator having a support medium for the strontium-82 comprising a compound of the formula

$$M_{10}(PO_4)_6(OH)_2,$$

where in M is calcium, strontium, barium, lead, iron, sodium, potassium, zinc, cadmium, magnesium, aluminum or a rare earth metal.

4,597,952

PURIFICATION OF SOLUTIONS OF SODIUM ALUMINATE IN THE BAYER CYCLE BY THE REMOVAL OF SODIUM OXALATE

Jean Fabre; Eric Lavalou, and Francois Nicolas, all of Aix-en-Provence, France, assignors to Aluminium Pechiney, Paris, France

Filed Jun. 24, 1985, Ser. No. 747,955
Claims priority, application France, Jun. 25, 1984, 84 10187; Apr. 18, 1985, 85 06283
Int. Cl.[4] C01F *7/06*
U.S. Cl. 423—122 31 Claims

1. In the Bayer cycle, wherein bauxite ore is treated with an aqueous sodium hydroxide solution to solubilize the alumina producing a supersaturated sodium aluminate solution and a solid phase of red mud, the red mud is separated from the sodium aluminate solution, the sodium aluminate solution is seeded with aluminum trihydroxide particles to cause precipitation of aluminum trihydroxide from the solution, and the solution is recycled for further treatment of bauxite ore,

the improvement comprising a process for purifying at least a fraction of said solution from which aluminum trihydroxide has been precipitated, comprising the steps of:

(a) introducing into said at least a fraction, a supersaturation destabilization agent selected from the group consisting of calcium oxalate and barium oxalate, thereby causing precipitation of sodium oxalate;

(b) separating said precipitated sodium oxalate from said at least a fraction; and

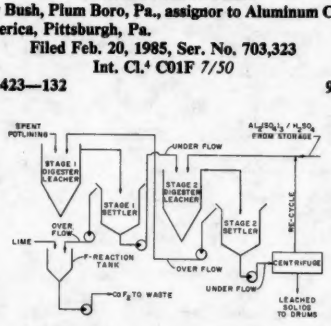
(c) recycling said at least a fraction from which said sodium oxalate has been separated, for further treatment of said bauxite ore.

4,597,953

HALOGEN RECOVERY

J. Finley Bush, Plum Boro, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Feb. 20, 1985, Ser. No. 703,323
Int. Cl.[4] C01F *7/50*
U.S. Cl. 423—132 9 Claims



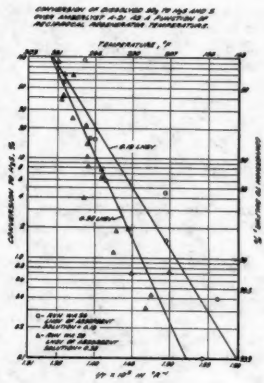
1. Dissolving fluorine in a bath having an aluminum sulfate/-sulfuric acid ratio in the range of about 0.75 to 1.0.

4,597,954

PROCESS FOR REMOVING SOX AND NOX COMPOUNDS FROM GAS STREAMS

Robert H. Hass, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 151,783, May 21, 1980, Pat. No. 4,372,932, Continuation-in-part of Ser. No. 907,189, May 18, 1978, Pat. No. 4,222,991. This application Sep. 29, 1982, Ser. No. 427,958
The portion of the term of this patent subsequent to Sep. 16, 1997, has been disclaimed.
Int. Cl.[4] C01B *21/00, 17/00*; C02F *1/70*
U.S. Cl. 423—138 23 Claims



1. A process for treating a feed aqueous solution containing a ferric chelate, which process comprises (1) contacting in the presence of formate ion, said feed aqueous solution with a water-insoluble, solid substance containing a tertiary amine functional group under conditions, including an elevated temperature, such that a substantial proportion of said ferric chelate is converted to the corresponding ferrous chelate, and (B 2) recovering a product aqueous solution containing an increased content of ferrous chelate in comparison to said feed aqueous solution.

4,597,955

PROCESS FOR RECOVERING CESIUM FROM CESIUM ORE

Peter G. Mein, LaSalle, Ill., assignor to Carus Corporation, LaSalle, Ill.

Filed May 1, 1985, Ser. No. 729,463
The portion of the term of this patent subsequent to May 8, 2001, has been disclaimed.
Int. Cl.[4] C01G *45/12*
U.S. Cl. 423—184 12 Claims

1. A process for recovering cesium from a cesium-bearing mineral wherein the finely-divided mineral is roasted in admixture with an alkaline flux to convert the cesium to a water-soluble salt, the roasted mineral is extracted with water to obtain an aqueous solution of the cesium salt together with soluble salts and/or hydroxides of other alkali and alkaline earth metals, and the aqueous solution is separated from the residual solids, wherein the improvement comprises:

(a) adding a water-soluble permanganate to said aqueous solution and selectively precipitating cesium permanganate ($CsMnO_4$) in the presence of the other soluble metal compounds; and

(b) separating the precipitate from the residual solution to obtain $CsMnO_4$ of high purity.

4,597,956

TREATMENT PROCESS FOR REMOVING FLUORIDE IMPURITIES FROM ALUMINOSILICATES

Richard J. Hinchey, Heemstede, Netherlands, and Alexander J. Caglione, Nyack, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 509,604, Jun. 30, 1983, abandoned. This application Mar. 4, 1985, Ser. No. 707,804

Int. Cl.[4] C01B *33/28;* B01J *29/06*

U.S. Cl. 423—328 12 Claims

1. The process for treating fluoride-containing aluminosilicates to decrease the amount of insoluble fluoride compounds contained therein comprising treating said fluoride-containing aluminosilicate with an effective amount of a solution of a soluble aluminum compound at an effective temperature and for an effective time whereby the amount of insoluble fluoride compounds associated with said aluminosilicate is decreased.

4,597,957

PROCESS FOR ELECTROLYTICALLY PRODUCING METALLIC OXIDE FOR FERRITE

Koichi Oku, Matsudo, and Kiyoshi Matsuura, Kiryu, both of Japan, assignors to Japan Metals and Chemicals Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1985, Ser. No. 707,250

Claims priority, application Japan, Mar. 6, 1984, 59-42548; Apr. 13, 1984, 59-74615; Dec. 20, 1984, 59-268783; Jan. 28, 1985, 60-13943

Int. Cl.[4] C01G *49/00*

1. A process for electrolytically producing a metal oxide of ferrite comprising:

forming a solution comprising 2% to 20% of an inorganic ammonium salt and .01% to 5% of a fluoride compound, said solution functioning as an electrolyte;

separating said solution into an anode side and a cathode side using a membrane which has anionic exchangeability;

electrolyzing said solution using an anode and a cathode, said anode comprising at least one first metal and at least one second metal, said at least one first metal being selected from the group consisting of zinc, magnesium, nickel, cobalt, copper, lead, cadmium, barium and strontium, said at least one second metal being selected from the group consisting of iron and manganese, said cathode comprising graphite, said first and second metals of said anode being dissolved into said solution on said anode side during said electrolysis;

combining said solution from said anode side with said solution from said cathode side after said electrolysis to form a solution containing a hydroxide of said first and second metal dissolved from said anode;

adding hydrogen peroxide to the solution containing the hydroxide of said metal to oxidize said metal and to produce a precipitate of a metal hydroxide of ferrite;

filtering said precipitate;

drying said precipitate; and

calcining said precipitate to form a metal oxide.

4,597,958

METHOD OF PRODUCING HYDRATED IRON OXIDE

Nobuo Takagi, Tokyo; Masakazu Konno, and Takeo Kobayashi, both of Saitama, all of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed Sep. 17, 1984, Ser. No. 651,222

Int. Cl.[4] C01G *49/02*

U.S. Cl. 423—633 9 Claims

1. A method for the production of acicular iron oxide hydroxide which comprises:

(a) forming an aqueous solution having a pH in the range of 2.5 to 4 from a ferric salt and an alkali by adding an aqueous solution of the alkali to an aqueous solution of the ferric salt;

(b) maintaining said solution at said pH under conditions of continuous agitation at a temperature in the range of 20° to 100° C. for a period of time in the range of 5 to 240 minutes to effect formation of a suspension of nuclei crystals of an iron oxide hydroxide;

(c) thereafter adjusting the pH of the suspension to a value within the range of 10 to 13.5 by the addition of an alkali and aging the suspension for a period of about four hours at a temperature in the range of 20° to 100° C. to effect the growth of acicular crystals of iron oxide hydroxide.

4,597,959

SUSTAINED RELEASE BREATH FRESHENER, MOUTH AND PALATE COOLANT WAFER COMPOSITION AND METHOD OF USE

Arthur Barr, 2942 Shore Dr., Merrick, N.Y. 11566

Filed Apr. 30, 1982, Ser. No. 373,342

The portion of the term of this patent subsequent to Sep. 29, 1998, has been disclaimed.

Int. Cl.[4] A61K *9/26, 9/50*

U.S. Cl. 424—19 10 Claims

1. A method of releasing a flavoring material and providing effective protection against bad breath in the mouth of a user, said method comprising forming a wafer composition consisting of microencapsulated droplets of liquid flavoring material in a base or carrier, said microencapsulated droplets having a coating which is substantially non-soluble in water but which is soluble in the saliva of the mouth, said wafer having adhesive therein such that when the wafer is placed at any convenient place on the palate or on the upper or lower gums, adjacent to the cheek of the user, thereafter the saliva in the mouth causes the adhesive therein to adhere to the gum and at the same time the flavoring material is slowly released, at a sustained rate, in situ in the mouth as the droplets of material are slowly dissolved, thereby to offer effective relief against bad breath, for periods of time in the order of 4–6 hours, said microencapsulated droplets being present in an amount of 35–45% by weight and consisting essentially of liquid flavoring material in an amount of 85–95%, and an encapsulating wall material of cross-linked gelatin in an amount of 5–15% by weight, said base or carrier consisting essentially of an adhesive.

4,597,960

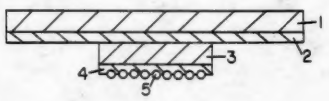
MICROENCAPSULATED ASTRINGENT HEMOSTATIC AGENTS AND METHODS OF USE

Edgar C. Cohen, 4123 Vincennes Pl., New Orleans, La. 70125

Continuation-in-part of Ser. No. 486,472, Apr. 19, 1983, abandoned. This application Jun. 3, 1983, Ser. No. 500,689

Int. Cl.[4] A61K *33/06, 33/26;* A01N *59/06, 59/16*

U.S. Cl. 424—28 12 Claims



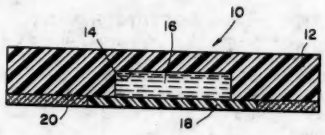
1. A granular composition for producing capillary hemostasis, comprising:

a granular astringent hemostatic agent selected from the group consisting of ferric and aluminum inorganic salts encapsulated with a cellulose-based biocompatible polymer soluble in body fluids.

4,597,961
TRANSCUTANEOUS APPLICATION OF NICOTINE

Frank T. Etscorn, 121 Stallion Cir., Socorro, N. Mex. 87801

Filed Jan. 23, 1985, Ser. No. 694,047
Int. Cl.[4] A61K 9/70, 31/465
U.S. Cl. 424—28 19 Claims



1. A method of administering nicotine for the purpose of satisfying a nicotine habit while minimizing or eliminating side effects caused by absorbing nicotine through the lungs along with products of combustion of tobacco, comprising transdermally administering nicotine via an occlusive pad adhered to the skin at a dosage rate sufficient to satisfy said nicotine habit, said occlusive pad comprising a nicotine-impermeable backing and nicotine-permeable, porous, inert membrane, said nicotine impermeable backing and said nicotine-permeable membrane defining a cavity therebetween, said cavity containing liquid nicotine therein.

4,597,962
HAIR-CARE COMPOSITION AND HAIR TREATMENT PROCESS

Jean F. Grollier, Paris; Claude Dubief, Le Chesnay, and Daniele Cauwet, Paris, all of France, assignors to L'Oreal, Paris, France

Filed Jun. 28, 1984, Ser. No. 625,627
Claims priority, application Luxembourg, Jul. 1, 1983, 84894
Int. Cl.[4] A61K 7/06, 7/08, 7/09, 9/12
U.S. Cl. 424—47 13 Claims

1. A cosmetic composition for the treatment and care of hair, comprising (a) 0.05 to 7% by weight of a cationic surface-active agent which can be dispersed in water, (b) 0.05% to 7% by weight of a water-soluble quaternary polyammonium compound (c) 0.05 to 7% by weight of a cationic silicone polymer selected from the group consisting of: (I) having the formula:

$$-R'_aG_{(3-a)}-Si-(OSiG_2)_n(OSiG_bR'_{2-b})_m-O-SiG_{(3-a)}R'_a$$

where

G denotes H, phenyl, OH, or C_1–C_8-alkyl,

a denotes zero or an integer from 1 to 3,

p denotes zero or 1

n denotes zero or a number from 1 to 1,999

m denotes a number from 1 to 2,000

the total (n+m) denoting a number from 1 to 2,000

R' denotes a monovalent radical of the formula $C_qH_{2q}L$ in which q is 2 to 8 and L denotes:

$-NR''-CH_2-CH_2-NR''_2$

$-N(R'')_2$

$-\overset{+}{N}(R'')_3A^-$

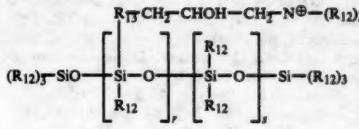
$-\overset{+}{N}(R'')H_2A^-$

$-NR''CH_2-CH_2-\overset{+}{N}R''H_2A^-$

in which R'' denotes H, phenyl, benzyl, or an alkyl radical having from 1 to 20 carbon atoms,

A^- represents Cl^-, Br^-, I^- or F^-,

(II) having the formula



in which

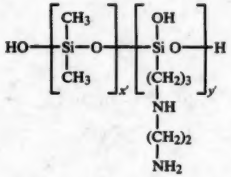
R_{12} denotes a monovalent hydrocarbon radical of 1 to 18 carbon atoms

R_{13} denotes a C_1–C_{18}-alkylene or C_1–C_{18}-alkyleneoxy divalent radical

Q^- denotes a Cl^- or Br^- ion

r denotes a number from 2 to 20 and represents a statistical mean value

S denotes a number from 20 to 200 and represents a statistical mean value, and (III)



where x' and y' are integers which depend on the molecular weight, the mean molecular weight being from 5,000 to 10,000 and (d) an aqueous or aqueous-alcoholic dispersion carrier; wherein the composition has a pH of from 3 to 10.

4,597,963
MOISTURE-RESISTANT SKIN TREATMENT COMPOSITIONS

George E. Deckner, Westfield, N.J., assignor to Charles of the Ritz Group Ltd., New York, N.Y.

Filed Oct. 5, 1984, Ser. No. 658,019
Int. Cl.[4] A61K 7/42, 7/44
U.S. Cl. 424—59 18 Claims

1. A moisture-resistant skin treatment composition in the form of a sunscreen composition or moisturizer composition, in the form of an oil-in-water emulsion or a water-in-oil emulsion, consisting essentially of from about 50 to about 90% by weight water, from about 1 to about 10% by weight emollient, from about 1 to about 10% by weight emulsifier, a preservative and a polyvinyl alkyl or alkenyl ester which is polyvinyl stearate, polyvinyl caprylate, polyvinyl pelargonate, polyvinyl caprate, polyvinyl undecanoate, polyvinyl laurate, polyvinyl tridecanoate, polyvinyl myristate, polyvinyl pentadecanoate, polyvinyl palmitate, polyvinyl margarate, polyvinyl monodecanoate, polyvinyl archidate, polyvinyl heneicosanoate, polyvinyl behenate, polyvinyl tricosanoate, polyvinyl tetracosanoate, polyvinyl pentacosanoate, polyvinyl oleate, polyvinyl linoleate, polyvinyl ricinoleate, polyvinyl palmitoleate, polyvinyl vaccenoate, polyvinyl erucoate, or polyvinyl licanoate in an amount within the range of from about 0.5 to about 10% by weight based on the total composition to impart moisture-resistance to said composition.

4,597,964

CATIONIC POLYDIORGANOSILOXANES FOR TREATING PROTEINACEOUS SUBSTRATES

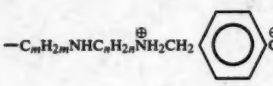
Maris J. Ziemelis, and Charles A. Roth, both of Midland, Mich., assignors to Aplin & Barrett, Ltd., Dorset, England and Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 561,404, Dec. 14, 1983, Pat. No. 4,472,566. This application May 30, 1984, Ser. No. 615,422

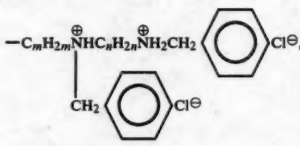
Int. Cl.[4] A61K *7/06, 7/09, 7/11, 7/15*

U.S. Cl. 424—70 11 Claims

1. A method for persistently adhering a polydiorganosiloxane to proteinaceous substrates, said method comprising applying to a proteinaceous substrate selected from the group consisting of human hair, human skin, animal fur and feathers a composition comprising a cationic polydiorganosiloxane having the general formula $Me_2QSiO(Me_2SiO)_x(MeRSiO)_ySiQMe_2$, wherein Me represents the —CH_3 radical, R represents a radical described by the formula



or



wherein m has a value of from 2 to 5 inclusive, and n has a value of from 1 to 5 inclusive, Q is selected from the group consisting of the R radical, the Me radical, and the —OH radical, x has a value of from 5 to 200, and y has a value of from 1 to 30.

4,597,965

METHOD AND COMPOSITION FOR CONTROLLING CORNEAL HYDRATION

Frank J. Holly, Lubbock, Tex., assignor to Holles Laboratories, Inc., Cohasset, Mass.

Continuation of Ser. No. 227,819, Jan. 23, 1981, abandoned, which is a division of Ser. No. 46,188, Jun. 7, 1979, Pat. No. 4,271,144. This application May 26, 1982, Ser. No. 382,249

Int. Cl.[4] A61K *31/78*

U.S. Cl. 424—81 5 Claims

1. A method of corneal dehydration in a human or animal eye comprising applying thereto an effective cornea dehydrating amount of an aqueous solution of a hydrophilic nonviscous polyacrylamide having an average molecular weight of between about 40,000 and about 150,000, said polyacrylamide being present at a colloidal osmolality between about 40 and 200 torr and in a concentration of from about 5 to 25% by weight.

4,597,966

HISTIDINE STABILIZED IMMUNOGLOBULIN AND METHOD OF PREPARATION

Raymond P. Zolton, Somerville, and Jennifer A. Nasser, Piscataway, both of N.J., assignors to Ortho Diagnostic Systems, Inc., Raritan, N.J.

Filed Jan. 9, 1985, Ser. No. 689,882

Int. Cl.[4] A61K *39/395*

U.S. Cl. 424—85 19 Claims

1. A stabilized immunoglobulin preparation comprising an aqueous solution of an immunoglobulin in a pharmacologically effective concentration; said solution being substantially free from anticomplement activity, containing histidine at a concentration sufficient to inhibit aggregation of said immunoglobulin, having a pH value of at least about 6.0 but not greater than 7.0 and a buffering capacity in that range; and a conductivity of about 2 to about 4 millisiemens at 5° C.

4,597,967

SYNTHETIC POLYPEPTIDE FRAGMENTS

Edwin H. Beachey, Memphis, Tenn., assignor to The University of Tennessee Research Corp., Knoxville, Tenn.

Division of Ser. No. 503,273, Jun. 10, 1983, Pat. No. 4,521,334, and a continuation-in-part of Ser. No. 402,355, Jul. 27, 1982. This application Feb. 12, 1985, Ser. No. 700,625

Int. Cl.[4] A61K *39/00, 39/385;* C07K *7/10*

U.S. Cl. 424—88 56 Claims

1. A synthetic antigen congugate which comprises a polyvalent linkable carrier covalently linked to a polypeptide which polypeptide comprises the amino acid sequence

Asn-Phe-Ser-Thr-Ala-Asp-Ser-Ala-Lys-Ile-Lys-Thr-Leu-Glu-Ala-Glu-Lys-Ala-Ala-Leu-A-Ala-B-C-Ala-D-Leu-E-F-Ala-Leu-Glu-G-H-I

wherein

A is Glu or Ala
B is Glu or Arg
C is Lys or Gln
D is Asp or Glu
E is Glu or Asp
F is Lys or Asp
G is Gly or Leu
H is Ala or Glu
I is Hse, Met, Gly-Ala-Hse, or Gly-Ala-Met,

with the proviso that the polypeptide is not any one of the four following sequences:

Asn-Phe-Ser-Thr-Ala-Asp-Ser-Ala-Lys-Ile-Lys-Thr-Leu-Glu-Ala-Glu-Lys-Ala-Ala-Leu-Ala-Ala-Arg-Lys-Ala-Asp-Leu-Glu-Lys-Ala-Leu-Glu-Gly-Ala-I, or

Asn-Phe-Ser-Thr-Ala-Asp-Ser-Ala-Lys-Ile-Lys-Thr-Leu-Glu-Ala-Glu-Lys-Ala-Ala-Leu-Glu-Ala-Arg-Gln-Ala-Glu-Leu-Glu-Lys-Ala-Leu-Glu-Gly-Ala-I,

wherein I is Met or Hse, which antigen elicits type-specific opsonic antibodies to *Streptococcus pyogenes* and which is not serologically cross-reactive with tissue antigens of the heart.

4,597,968

ANTIBIOTIC 13-384 COMPLEX FROM *MICROMONOSPORA CARBONACEA* VAR *AFRICANA*

Jay A. Waitz, Warren; Mahesh G. Patel, Verona; Joseph A. Marquez, Montclair, all of N.J.; Manohar G. Kalyanpur, Winchester, Mass., and Ann C. Horan, Summit, N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 405,822, Aug. 6, 1982, abandoned. This application Jun. 21, 1984, Ser. No. 623,266

Int. Cl.[4] A61K *35/74;* C12P *1/06*

U.S. Cl. 424—118 13 Claims

1. Antibiotic 13-384 component 1, a compound which:

(a) is effective in inhibiting the growth of various bacteria, especially gram positive bacteria;

(b) has an optical rotation $[\alpha]_D 26 = -42.8°$ (c 0.3%, methanol);

(c) has a characteristic ultraviolet absorption spectrum as shown in FIG. 3;

(d) has a characteristic infrared absorption spectrum as shown in FIG. 2;

(e) has characteristic ^1H and ^{13}C nuclear magnetic resonance spectra as shown in FIGS. 4 and 5, respectively; and

(f) has a molecular formula: $C_{70}H_{97}O_{38}NCl_2$

or a pharmaceutically acceptable salt thereof.

4,597,969

STABILIZATION OF UNSTABLE DRUGS OR FOOD SUPPLEMENTS

Howard C. Maxfield, Broxbourne; Anthony J. Phillips, Ware, and Richard J. Yarwood, Stevenage Old Town, all of England, assignors to Merck Sharp & Dohme, Hoddesdon, United Kingdom

Continuation-in-part of Ser. No. 365,418, April 5, 1982, abandoned.

This application Feb. 1, 1983, Ser. No. 462,115

Int. Cl.[4] A61K *33/08, 31/70, 31/71, 31/725*

U.S. Cl. 424—157 **19 Claims**

1. A stable granular formulation for administration in feed or feed-like components comprising:

(a) 0.1–70 parts by weight of Efrotomycin, Ivermectin, milbemycins, tylosin, AIV, antibiotic B-5050, antibiotic tetrahydro B-5050, mocimycin, dihydromocimycin, goldinomycin or a combination thereof;

(b) 10–80 parts by weight of a polysaccharide gelling agent selected from the group consisting of alginic acid and its salts

(c) 10–85 parts by weight of magnesium hydroxide.

4,597,970

CHEWING GUM COMPOSITIONS CONTAINING NOVEL SWEETENER DELIVERY SYSTEMS AND METHOD OF PREPARATION

Shri C. Sharma, Mendham, and Robert K. Yang, Morris Plains, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Oct. 5, 1984, Ser. No. 658,099

Int. Cl.[4] A23G *3/30*

U.S. Cl. 426—5 **23 Claims**

1. A chewing gum composition comprising a gum base and an agglomerated stable sweetener delivery system capable of effecting a controlled release of the sweetener comprising:

(A) at least one solid natural or artificial high intensity sweetener selected from the group consisting of amino acid based sweeteners, dipeptide sweeteners, glycyrrhizin, saccharin and its salts, acesulfame salts, cyclamates, steviosides, talin, dihydrochalcone compounds and mixtures thereof; and

(B) a hydrophobic matrix consisting essentially of

(i) lecithin; and

(ii) an edible material having a melting point in the range of about 25° C. to about 100° C. selected from the group consisting of (a) fatty acids having an iodine value of about 1 to about 10, (b) natural waxes, (c) synthetic waxes and (d) mixtures thereof; and

(iii) at least one glyceride.

4,597,971

SOFT CREAM CHEESE PRODUCT

Loren L. Davis, Vernon Hills, Ill., assignor to Kraft, Inc., Glenview, Ill.

Continuation-in-part of Ser. No. 66,613, Aug. 15, 1979, Pat. No. 4,324,804, and Ser. No. 251,046, Apr. 6, 1981, abandoned. This application Aug. 9, 1983, Ser. No. 521,631

The portion of the term of this patent subsequent to Apr. 13, 1999, has been disclaimed.

Int. Cl.[4] A23C *19/076, 19/09, 20/00*

U.S. Cl. 426—36 **4 Claims**

1. A soft bodied cream cheese product which is spreadable at refrigeration temperatures comprising a uniform blend of

from about 25 percent to about 75 percent by weight based on the weight of said cream cheese product of a cultrued cream cheese dressing mix comprising at least about 30 percent by weight of substantially unhomogenized milkfat based on the weight of said dressing mix, at least about 40 percent by weight of total dairy solids, and not more than 60 percent moisture, based on the weight of said dressing mix, and

from about 25 percent to about 75 percent by weight based on the weight of said cream cheese product of a firm bodied cream cheese curd from which whey has been separated and comprising at least about 30 percent by weight of homogenized milkfat, said homogenized milkfat having a particle size distribution which is smaller than that of said unhomogenized milkfat of said cultured cream cheese dressing mix, at least about 40 percent by weight of total dairy solids, and not more than about 60 percent by weight moisture based on the weight of said cultured cream cheese product,

said cultured cream cheese dressing mix and said firm bodied cultured cream cheese curd product being present in said blend in proportion to provide said cream cheese product with a milkfat content of at least about 33 percent by weight having a broad or biomodal particle size distribution which is broader than the particle size distribution of either said unhomogenized milkfat or said homogenized milkfat, a moisture content not exceeding about 55 percent by weight based on the weight of said cream cheese product, and a Haake standard Jelly rotor initial yield value of less than about 2500 at refrigeration temperature of 45° F.

4,597,972

NISIN AS AN ANTIBOTULINAL AGENT FOR FOOD PRODUCTS

Stephen L. Taylor, Madison, Wis., assignor to Aplin & Barrett, Ltd., Dorset, England

Continuation-in-part of Ser. No. 543,968, Oct. 20, 1983, which is a continuation of Ser. No. 503,305, Jun. 10, 1983, abandoned.

This application Mar. 2, 1984, Ser. No. 585,864

Int. Cl.[4] B29D *29/00, 35/00*

U.S. Cl. 426—36 **16 Claims**

1. A process for controlling the growth of *Clostridium botulinum* spores and the elaboration of botulinum toxin therefrom in a food product excluding a high moisture content pasteurized process cheese product, said process comprising adding to said product an amount of nisin or a nisin-producing culture sufficient to inhibit botulinum spore growth.

4,597,973

PROCESS FOR TREATING EDIBLE NUTS AND SEEDS

James H. Moore, 6700 A Filbro Dr., Gilroy, Calif. 95020

Filed Aug. 2, 1985, Ser. No. 761,873

Int. Cl.[4] A23L *1/36*

U.S. Cl. 426—93 **5 Claims**

1. A treatment process for edible nuts and seeds having been stored at low preserving temperature comprising:

(a) removing nuts from a low temperature storage facility,

(b) storing the nuts in a conditioned environment having a temperature in the range of 45 degrees F. to 55 degrees F. for sufficient time that the temperature of substantially each nut is substantially uniform between its center and surface,

(c) uniformly heating the conditioned nuts with heated air so as to cause the surface cells of the nuts to expand,

(d) spraying the still hot nuts uniformly with an unsaturated solution of sodium chloride in water, said solution having a temperature in the range of 78 degrees F. to 95 degrees F., the amount of sodium chloride thereby applied being between about 3 and 100 milligrams per ounce of the heated nuts, and

roasting the sprayed nuts at a temperature in the range of 275 degrees F. to 380 degrees F. to produce a final nut product having a moisture content in the range of 1.9% to 2.5%.

4,597,974

SAUCE AND GRAVY COMPOSITIONS

Jean L. Fonteneau, Le Boupere, and Jean P. Germon, Pouzauges, both of France, assignors to Fleury Michon, Pouzauges, France

Filed Sep. 20, 1984, Ser. No. 652,406

Int. Cl.[4] A23L *1/31, 1/39, 1/195*

U.S. Cl. 426—129 **39 Claims**

1. A sauce or gravy composition comprising:

a fat in an amount of about 1.5 to 2.5 weight percent;
at least one liquid of water, oil, meat cook-out juice, fish cook-out juice, wine, vinegar, or vegetable juice in an amount of about 70 to 90 weight percent;
rice starch in an mount of about 1.5 to 2.5 weight percent;
carob-bean flour in an amount of about 0.3 to 1 weight percent; and
at least one flavoring or spice in an amount of about 4 to 26.7 weight percent.

4,597,975

IODINE SURFACE ACTIVE COMPOSITIONS

Fred E. Woodward, 200 Churchill Rd., W. Palm Beach, Fla. 33405, and Alice P. Hudson, 728 W. Kalmia Dr., Lake Park, Fla. 33403

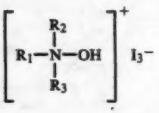
Continuation-in-part of Ser. No. 319,075, Nov. 6, 1981, abandoned, which is a continuation-in-part of Ser. No. 160,374, Jun. 17, 1980, abandoned, which is a continuation of Ser. No. 829,520, Aug. 31, 1977, abandoned, which is a continuation-in-part of Ser. No. 722,493, Sep. 13, 1976, abandoned, which is a continuation-in-part of Ser. No. 577,274, May 14, 1975, abandoned, and Ser. No. 577,303, May 14, 1975, abandoned. This application Oct. 11, 1983, Ser. No. 540,372

Int. Cl.[4] A01N *59/12, 33/24*

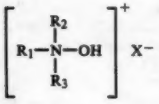
U.S. Cl. 424—150 **18 Claims**

1. A stable aqueous biocidal solution comprising

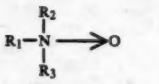
(a) an undissociated and by itself insoluble protonated amine oxide-triiodide salt of the structure



(b) a protonated amine oxide salt of the structure



(c) an amine oxide of the structure



(d) a water soluble acid of the structure HY

(e) one or more substances chosen from the group consisting of

(1) surface active phosphate esters

(2) nonionic surfactants

(3) water soluble solvent alcohols

wherein R_1 is alkyl containing about 10 to 18 carbon atoms and no unsaturation; R_2 and R_3 are methyl; Y is a radical selected from the group consisting of phosphate and phosphate esters, chloride, bromide, lactate, citrate, malate, glycolate, formate, oxalate, tartrate, and sulfate; and X is a radical selected from the group consisting of iodide and Y; the molar ratio of (a) to (b)+(c) being less than about 0.5 to 1, the molar ratio of (b) to (c) being at least about 2 to 1; (d) being present at a level sufficient to effect a pH of about 4.3 or lower; and (b)+(c) or said group substance (e), or (b)+(c) and said group substance (e) taken together being present in an amount at least sufficient to effect a transparent solution; said solution containing no molecular iodine as determined spectrophotometrically; said biocidal solution resulting from mixing a water solution of from about 2 to 67 molar equivalents of one or more amine oxides of structure (c) with one molar equivalent of iodine, acid (d) in sufficient quantity to lower the pH to about 4.3 or lower, and sufficient said group substance (e) to effect a transparent solution.

4,597,976

PROCESS FOR PRODUCING SHELF STABLE PASTA CONTAINING PRODUCT

Robert C. Doster, Van Nuys, and Karen F. Kahn, Simi Valley, both of Calif., assignors to Nestec S.A., Vevey, Switzerland

Filed Dec. 7, 1983, Ser. No. 558,907

Int. Cl.[4] A23L *3/00, 1/16*

U.S. Cl. 426—325 **9 Claims**

1. A process for producing commercially sterile, hydrated pasta-containing product containing a pasta component having a firm texture, and a liquid sauce component which comprises

forming an acidified pasta dough by mixing a farinaceous material selected from the group consisting of semolina, durum flour, farina, flour, and mixtures thereof, sufficient edible acid to provide the pasta dough with a pH of less than 4.6, from 2–20% by weight of gluten, from 3–25% by weight of an egg material selected from the group consisting of whole eggs, egg white and egg yolk, from 0–5% of glyceryl monostearate, and sufficient water to provide an acidified dough have a moisture content of from 25%–38%,

forming the acidified dough under pressure into a pasta component selected from the group consisting of spaghetti, macaroni, noodles and sheets,

preparing a liquid sauce component having a pH of below 4.6,

heating the pasta component and the sauce component to a temperature of at least 185° F. and combining said components, while at a temperature of at least 185° F., in a container so that the sauce component surrounds the pasta component,

sealing the container, and

heating processing the sealed container under atmospheric conditions to provide a sterilizing value equivalent to about 10 minutes at 200° F., whereby the contents of the container are rendered commercially sterile without adversely affecting the taste, texture or appeaance of the pasta.

4,597,977

METHOD AND APPARATUS FOR SEPARATING HULLS AND DEBRIS FROM PLANT PRODUCTS

Ben S. Brown, Rte. 1, Baldwin, Ga. 30511

Filed Jun. 7, 1985, Ser. No. 742,551

Int. Cl.[4] B02B *3/08*

U.S. Cl. 426—482 **18 Claims**

1. A method of separating hulls and debris from a plant product selected from the group consisting of peas, beans and peanuts so as to obtain the kernels from said plant product comprising:

inclining a foraminous container which has an input and an output end so that the container is higher on an input end and feeding product into the input end of said container during movement thereof,

rotating the product in the container and engaging the product with a plurality of spaced striking members to separate hulls and debris from kernels,

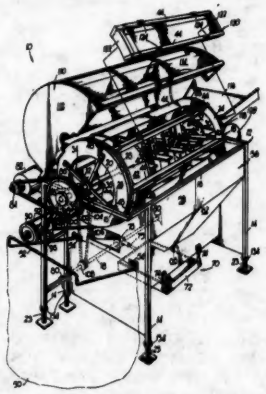
delivering the hulls and debris to the output end of the container while the container is rotating,

providing a separating means within said container and causing hulls and debris to be separated from the kernels and to move to the output end,

dropping the kernels beneath the container,

and thereafter collecting some of the hulls and debris

through an opening in the container at the output end of the container and collecting the kernels from the bottom



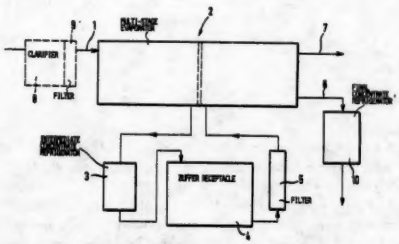
of the container after the kernels have dropped from the container during rotation.

4,597,978

METHOD OF CONCENTRATING GRAPE JUICE

Michael H. Dimitriou, Bretten, Fed. Rep. of Germany, assignor to W. Schmidt GmbH & Co. KG, Bretten, Fed. Rep. of Germany

Filed Dec. 27, 1984, Ser. No. 686,882
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1984, 3402389
Int. Cl.[4] A23L *2/08, 2/30*
U.S. Cl. 426—492 3 Claims



1. A method of concentrating grape juice, containing cream of tartar, to a predetermined final degree of concentration, comprising the following steps:

(a) evaporating one part of the water content of the grape juice to obtain an intermediate degree of concentration which is 40% to 70% of said final degree of concentration;

(b) subsequent to step (a), stabilizing the grape juice for cream of tartar; said stabilizing step including the step of cooling the grape juice to near freezing temperature and separating cream of tartar from the cooled, partially concentrated grape juice; and

(c) subsequent to step (b), resuming evaporation of water of said grape juice for ultimately reaching said final degree of concentration.

4,597,979

METHOD OF PREPARING PERFORATED PITA BREAD

Alexander Goglanian, 401 E. 15th St., Newport Beach, Calif. 92660

Filed Apr. 25, 1983, Ser. No. 488,154
Int. Cl.[4] A21D *8/02*
U.S. Cl. 426—496 8 Claims

1. A method of manufacturing pita bread, comprising:

forming pita dough into a flat dough form;

weakening said flat dough form along a line sufficiently to provide a preferential rupture line;

baking said flat dough form such that baking-induced gases inflate said dough form to create the characteristic pocket in the bread and subsequently cause said dough form to rupture in response to the baking-induced inflation pressure along said preferential rupture line; and

cooling said dough form to yield a flat, two-layer pita bread ruptured along said preferential rupture line.

4,597,980

PROCEDURE FOR THE PRODUCTION OF FOOD FOAMS

Regina Böttcher, Berlin; Hubert Juhnke, Potsdam-Babelsberg; Gabriele Kulawick, Potsdam; Günter Zehle, Bergholz-Rehbrücke, and Helmut Zösche, Potsdam, all of German Democratic Rep., assignors to Institut fuer Getreideverarbeitung im VEB Kombinat Nahrungsmittel und Kaffee, Bergholz-Rehbruecke, German Democratic Rep.

Filed May 21, 1984, Ser. No. 612,190
Int. Cl.[4] A23J *3/02*
U.S. Cl. 426—568 6 Claims

1. A method for the production of an edible food foam which consists essentially of:

(a) providing a fluid edible medium selected from the group consisting of a whole egg/sugar mixture, an egg white solution, and a cream product, said fluid edible medium being flowable and pumpable;

(b) providing a dispersion and foaming gas selected from the group consisting of ambient air and nitrogen;

(c) filtering said dispersion and foaming gas, so as to remove dust and dirt particles, and thereby to produce a cleaned dispersion and foaming gas of good sanitary condition, and usable for food industry;

(d) separately inducting said fluid edible medium of step (a) and said cleaned dispersion and foaming gas of step (c) through separate parallel flow delivery conduits and to a mixing and pressurizing induction and displacement working element of a screw pump or a rotary pump, the ratio between the cross-section of the gas conduit and the medium conduit being about 3:1;

(e) separately feeding in discrete, physically separated streams said fluid edible medium and said gas to said pump element in a volume ratio of at least about 1:8, whereby said fluid edible medium and said gas are first combined and mixed by and in contact with the working elements of said pump element, so that an effluent mixture is produced in and discharged from said pump element;

(f) delivering the resultant effluent mixture discharged from said pump element, and under a pressure in the range of about 0.19 to 0.98N/mm^2 (newton per square millimeter), to a dispersion tube element, said dispersion tube element containing internal filling elements which permit fluid flow through said dispersion tube element while causing said mixture to foam, so as to form a product stable edible food foam in said dispersion tube element, said fluid edible medium and said gas being thereby foamed in a volume ratio such that a volume yield of at least 900% is obtained; and

(g) removing and recovering said product edible food foam from the outlet end of said dispersion tube element.

4,597,981

SOFT CANDY COMPOSITION

Howard Kastin, 1262 Park St., Atlantic Beach, N.Y. 11509

Continuation-in-part of Ser. No. 563,678, Dec. 20, 1983, Pat. No. 4,528,206. This application Jun. 7, 1985, Ser. No. 742,540
The portion of the term of this patent subsequent to Jul. 9, 2002, has been disclaimed.
Int. Cl.[4] A23G 3/00
U.S. Cl. 426—660 18 Claims

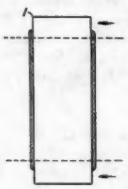
1. A soft candy composition consisting essentially of:
(a) 9–82% by weight of a hydrogenated starch hydrolysate;
(b) 82–9% by weight of at least one polymer of glucose or maltose;
(c) 3–16% by weight of gelatin; and
(d) a sufficient quantity of water to form said soft candy composition.

4,597,982

METHOD FOR PROCESSING FLEXIBLE SHEETS

William D. Delameter, 1944 Eddy St., San Francisco, Calif. 94115

Continuation-in-part of Ser. No. 359,589, Mar. 18, 1982, abandoned. This application Nov. 7, 1983, Ser. No. 549,400
Int. Cl.[4] A01G 5/00; A01N 1/02; G01N 1/00, 1/30
U.S. Cl. 427—2 12 Claims



1. A method of applying processing liquid from a flat platen to a biological specimen on the first face of a flexible sheet having first and second faces, said method comprising the steps of:
(a) joining said second face of said sheet to one face of a rigid flat plane to fix said sheet in a substantially planar configuration; and
(b) drawing said first face of said sheet over said platen while maintaining a substantially constant gap therebetween, said gap being filled with said processing liquid and sufficiently narrow to retain said processing liquid therein by capillary attraction, thereby wetting said first face of said sheet with said processing liquid.

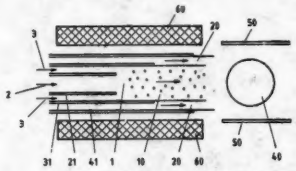
4,597,983

METHOD FOR PRODUCING A DIRECTED AEROSOL STREAM

Reinhart Kühne, and Max Kuisl, both of Ulm, Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 19, 1984, Ser. No. 632,291
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1983, 3326043
Int. Cl.[4] B05D 1/06
U.S. Cl. 427—27 20 Claims

1. A method for producing a directed aerosol stream from gaseous and/or vapor phase reactants, comprising;
conveying gaseous and/or vapor phase reactants to a reaction site in a reaction chamber;
reacting the reactants at the reaction site in a flame free chemical reaction to produce an aerosol composition;
allowing the aerosol composition to pass from the reaction site; and immediately surrounding the aerosol composition with a moving, essentially aerosol free, gas and/or vapor stream; wherein the reactants and the aerosol free gas and/or vapor stream and conveyed to the reaction site through essentially concentrically arranged conduits and the aerosol free gas and/or vapor stream is conveyed



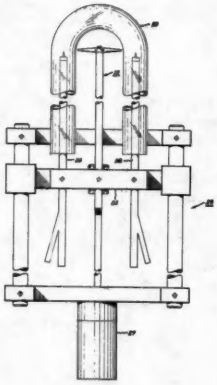
through the outermost of the concentrically arranged conduits; whereby a directed aerosol stream enveloped in an aerosol free gas and/or vapor stream is formed.

4,597,984

METHOD AND APPARATUS FOR COATING FLUORESCENT LAMP TUBES

Jon B. Jansma, University Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 740,460, Jun. 3, 1985, abandoned. This application Dec. 20, 1985, Ser. No. 811,891
Int. Cl.[4] B05D 1/06, 7/22
U.S. Cl. 427—28 28 Claims



1. An apparatus for applying phosphor coatings to U-shaped fluorescent lamp tubes while said lamp tubes are disposed in suitable holding means comprising:
power supply means for supplying a high voltage d-c potential;
electrode means connected to said power supply means for applying a high voltage d-c potential in close proximity to a U-shaped fluorescent lamp tube;
particulate material supply means for supplying a continuous flow of particulate material;
particulate material deposition means connected to said particulate material supply means for providing said particulate material into the interior of said lamp tube and for applying an electrical charge to said particulate material and dispersing said particulate material into said interior of said lamp tube; and
means for moving said electrode means and said particulate material deposition means relative to said lamp tube.

12. A method of depositing a phosphor coating on the interior surface of U-shaped fluorescent lamp tubes comprising the steps of:
supplying particulate phosphor material to the interior of a

fluorescent lamp tube via a pair of phosphor supply tubes disposed inside a U-shaped glass lamp tube;

applying an electrical charge of a first predetermined polarity to particles of said particulate phosphor material as said particles exit each respective one of said phosphor supply tubes;

applying an electrical charge of a second predetermined polarity opposite said first polarity to said lamp tube; and

moving said phosphor supply tubes relative to said lamp tube so that a generally uniform coating of said particulate phosphor material is deposited over the inner surface of said fluorescent lamp tube.

4,597,985

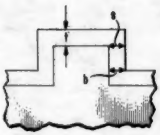
LOW TEMPERATURE DEPOSITION OF SILICON OXIDES FOR DEVICE FABRICATION

Edwin A. Chandross, Berkeley Heights; Robert E. Dean, High Bridge, and Gerald Smolinsky, Madison, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 629,950, Jul. 11, 1984, abandoned. This application Apr. 15, 1985, Ser. No. 722,433

Int. Cl.[4] B05D *3/14*

U.S. Cl. 427—39 **9 Claims**



1. A process for forming a device including a region of a silicon oxide comprising the steps of subjecting a substrate to an environment into which a gas is introduced and inducing a reaction that leads to deposition of said silicon oxide on said substrate characterized in that

said gas comprises a composition chosen from the group consisting of diacetoxyditertiarybutoxysilane (DADBS), diacetoxydiisopropoxysilane (DADIS), and tritertiarybutoxyethoxysilane (TBES), wherein said deposition is induced at a temperature less than 600 degrees C. and whereby said deposition has a conformance of at least 0.9.

4,597,986

METHOD FOR PHOTOCHEMICAL VAPOR DEPOSITION

Robert Y. Scapple, Los Angeles; John W. Peters, Malibu; Jacques F. Linder, Palos Verdes, and Edward M. Yee, Canyon Country, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 636,446, Jul. 31, 1984. This application Aug. 12, 1985, Ser. No. 764,815

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—53.1 **5 Claims**

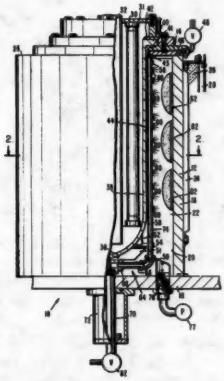
1. A method for forming a layer of a selected material on the surface of a chosen substrate, said selected material being the product of a photochemical vapor reaction of one or more selected vapor phase reactants, said reaction being induced by radiation of a predetermined wavelength or combination of wavelengths, said method comprising the steps of:

(a) providing an outer reactor shell having an inner wall defining the outer limit of a photochemical reaction zone;

(b) providing an inner shell concentric with said outer reactor shell, having an outer wall defining the inner limit of said reaction zone, having an inner wall defining a central space in said apparatus, said outer and inner walls being transparent to said radiation of predetermined wavelength or combination of wavelengths;

(c) mounting one or more substrates at spaced locations adjacent said inner wall of said outer reactor shell;

(d) introducing said selected vapor phase reactants into said reaction zone through a gas manifold having a plurality of spaced outlets directed towards said inner wall of said outer reactor shell, said gas outlets being moved relative to said inner wall to provide uniform distribution of said vapor phase reactants within said reaction zone;



(e) producing radiation of a predetermined wavelength or combination or wavelengths sufficient to induce said photochemical vapor reaction to form said layer, said radiation being produced by radiation means located within said central space in said apparatus and isolated from said reaction zone by said inner shell, wherein the quantity and uniformity of said radiation transmitted into said reaction zone is maximized, to thereby provide a uniform said layer of said selected material and an enhanced rate of deposition of said layer.

4,597,987

ORGANOPOLYSILOXANES CONTAINING BOTH ACRYLOXYALKYL GROUPS AND SI-BONDED HYDROGEN ATOMS IN THE SAME MOLECULE

Friedrich Hockemeyer, Emmerting, and Gerhard Preiner, Burghausen, both of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Division of Ser. No. 493,500, May 11, 1983, Pat. No. 4,558,111. This application Jun. 18, 1984, Ser. No. 622,342

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1982, 3222839

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—54.1 **6 Claims**

1. A method for coating a substrate which comprises applying an orgnopolysiloxane having a viscosity of at least 100 mPa.s at 25° C. and having SiC-bonded acryloxyalkyl groups and Si-bonded hydrogen in the same molecule to a substrate and thereafter crosslinking the organopolysiloxane with a source of radiation.

4,597,988

PROCESS FOR PREPARING PRINTED CIRCUIT BOARD THRU-HOLES

Peter E. Kukanskis, Woodbury, and Harold L. Rhodenizer, Bethlehem, both of Conn., assignors to MacDermid, Incorporated, Waterbury, Conn.

Continuation of Ser. No. 501,295, Jun. 6, 1983. This application Jul. 26, 1985, Ser. No. 759,590

Int. Cl.[4] C23C *18/22;* H05K *3/42*

U.S. Cl. 427—97 12 Claims

1. A process for depositing a conductive metal layer on the surfaces of a thru-hole formed in a multilayer printed circuit board substrate comprised of a conductive metal and epoxy resin laminate having one or more conductive metal innerlayers, comprising the steps of:

(a) subjecting said thru-hole to a desmearing process;

(b) thereafter contacting said thru-hole surfaces with a solvent capable of removing resin residue from said surfaces;

(c) thereafter contacting said thru-hole surfaces with an alkaline solution comprising potassium permanganate having a pH in excess of 13; and

(d) thereafter depositing a conductive metal layer on said thru-hole surfaces.

4,597,989

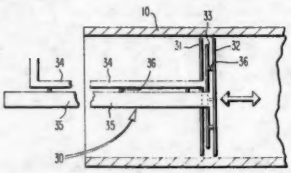
METHOD OF DEPOSITING SILICON FILMS WITH REDUCED STRUCTURAL DEFECTS

Casimir J. Wonsowicz, and Glenn R. Canfield, both of San Diego, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jul. 30, 1984, Ser. No. 635,833

Int. Cl.[4] B08B *9/00*

U.S. Cl. 427—99 11 Claims



1. A method of mass producing defect-free films of a silicon substance on integrated circuit wafers in a quartz chamber including the steps of:

passing a reactant gas which contains silicon over a batch of said wafers in said quartz chamber to deposit said silicon substance on both said wafers and the quartz walls of said chamber;

repeating said passing step on other batches of wafers until the thickness of said silicon substance on said quartz walls exceeds a predetermined limit;

directing a forceful stream of gas against said quartz walls to knock microscopic particles of said silicon substance therefrom;

removing said knocked-off microscopic particles from said chamber; and

continuing said passing and repeating steps with no intervening acid etch of said silicon substance on said quartz walls.

4,597,990

PREPARATION OF MAGNETIC RECORDING MEDIA

Hermann Roller; Joachim Hack, both of Ludwigshafen; Uwe Woweries, Wachenheim; August Lehner, Roedersheim-Gronau; Werner Graii, Bobenheim-Roxheim; Peter Nagel, Willstaett, and Roland Falk, Achern, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 27, 1985, Ser. No. 769,979

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1984, 3432016

Int. Cl.[4] H01F *10/02*

U.S. Cl. 427—130 5 Claims

1. A process for the preparation of a magnetic recording medium by dispersing pulverulent magnetic material in a binder mixture which is dissolved in an organic solvent and essentially consists of an elastomeric polyurethane and a high molecular weight hydroxyl-containing polymer, with addition of dispersing assistants and conventional additives, applying a layer of the dispersion, to which a diisocyanate and/or polyisocyanate has first been added, to a base material and then solidifying the layer and crosslinking the binder matrix, wherein the diisocyanate and/or polyisocyanate is added to the dispersion and, before applying the dispersion to the base, from 15 to 55% of the NCO groups present react with the hydroxyl-containing polymer of the binder mixture.

4,597,991

METHOD FOR PRODUCING HEAT CURABLE PARTICLES

John W. Graham, Rte. 5, Box 289, Alvin, Tex. 77511, and A. Richard Sinclair, 2903 Virginia, Houston, Tex. 77098

Division of Ser. No. 437,431, Oct. 27, 1982, Pat. No. 4,518,039. This application Feb. 26, 1985, Ser. No. 705,712

Int. Cl.[4] B05D *7/00*

U.S. Cl. 427—214 18 Claims

1. A method for producing free-flowing heat curable particles, useful in the production of shell molds and cores in the foundry industry and in the treatment of subterranean formations, comprised of high strength centers and a heat curable resin coating comprising:

incorporating a coupling agent into said heat curable resin;

coating said centers with a coupling agent;

reacting said coupling agent with said centers;

heating said centers to a temperature above the melting point of said resin;

adding said resin to said centers;

mixing said resin and said centers until said resin is dispersed over the surface of said centers; and

quenching said mixture with water.

4,597,992

PROCESS FOR REGENERATING A MAN CONVEYOR HANDRAIL

Mikio Kawashima, Kashiwa, Japan, assignor to Hitachi Elevator Engineering & Service Co., Ltd., Tokyo, Japan

Filed Jan. 3, 1985, Ser. No. 688,550

Claims priority, application Japan, Sep. 11, 1984, 59-188857

Int. Cl.[4] B32B *35/00*

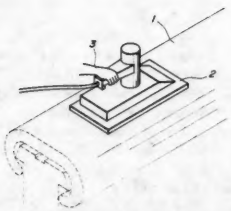
U.S. Cl. 427—140 8 Claims

1. A process for regenerating a man conveyor handrail, which process comprises the following steps:

grinding the surface of the handrail with a fine waterproof abrasive paper in the presence of water to finish the surface into a smooth and ground surface;

degreasing the thus-ground smooth surface of the handrail with a low-solubility solvent; and

coating a solution, which contains a room-temperature curable silicone resin containing methoxy groups and an organic solvent having a kauri-butanol value smaller than 100, onto the thus-degreased surfaces of the handrail.

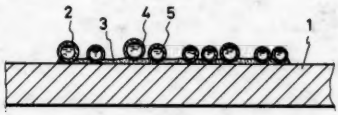


4,597,993

PARTIALLY PRESSURE-SENSITIZED RECORDING PAPER AND PROCESS FOR PREPARING THE SAME

Yoshio Okada, and Yuriko Igarashi, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1984, Ser. No. 661,157
Claims priority, application Japan, Oct. 27, 1983, 58-201841
Int. Cl.⁴ B41M *3/00, 5/16*
U.S. Cl. 427—150 **6 Claims**



1. A process for preparing a recording paper which is partially pressure-sensitized, comprising painting a specified part of a surface of a sheet material with a not-yet hardened binder, adhering microcapsules containing a color former therewithin to the not-yet hardened binder painted on the specified part of the surface of the sheet material and then fixing the microcapsules to the surface of the sheet material using the binder while hardening the not-yet hardened binder painted on the specified part of the surface of the sheet material so as to expose at least a part of a microcapsule to the outside of the space occupied by the binder.

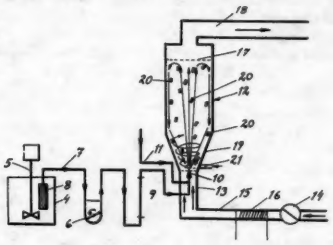
4,597,994

METHOD OF PRODUCING PROGRESSIVELY BURNING ARTILLERY PROPELLANT POWDER AND AGENT ADAPTED THERETO

Boo Bolinder, and Hermann Schmid, both of Karlskoga, Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

Filed Jan. 9, 1985, Ser. No. 690,072
Int. Cl.⁴ B05D *1/22*
U.S. Cl. 427—213 **15 Claims**

1. A method of producing a progressively burning deterrent-coated propellant powder for weapons having a barrel which comprises coating the outer surfaces of the said propellant powder with a film-forming deterrent substance by feeding to said powder said deterrent substance dissolved or dispersed in water and, thereafter, driving off said water.

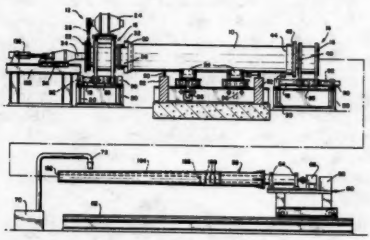


4,597,995

HIGH SPEED PIPE LINING METHOD AND APPARATUS

William E. Snow, and Thomas R. Warren, both of Birmingham, Ala., assignors to American Cast Iron Pipe Company, Birmingham, Ala.

Filed Mar. 29, 1985, Ser. No. 717,730
Int. Cl.⁴ B05D *7/22*; B05C *11/12, 13/00, 13/02*
U.S. Cl. 427—231 **25 Claims**



1. A method of lining pipe comprising rotating a length of pipe at a first speed about its longitudinal axis while depositing within the interior of the pipe uniformly along the length of pipe a predetermined quantity of lining material, the first speed being selected to spread the lining material evenly about the interior surface of the pipe; increased the rotational speed of the pipe to a second speed substantially higher than the first speed; and repetitively striking one end of the pipe for a predetermined period of time to impart vibrations to the pipe in a direction parallel to its longitudinal axis while simultaneously rotating the pipe at the second speed so as to compact said lining material.

12. Apparatus for lining pipe comprising first and second spindle means movable into engagement with the ends of a length of pipe to be lined for supporting the pipe therebetween; means for rotating the spindle means at first and second speeds about an axis corresponding to the longitudinal axis of the pipe, the second speed being substantially higher than the first speed; means for depositing within the interior of the pipe uniformly along the length of the pipe, while the pipe is being rotated at the first speed, a predetermined quantity of lining material, the first speed being selected so as to spread the lining material evenly about the interior surface of the pipe; and means for repetitively striking one end of the pipe to impart vibrations to the pipe in a direction parallel to the longitudinal axis of the pipe while the pipe is being rotated at the second speed so as to compact said lining material.

4,597,996

PROCESS OF LAMINATING WITH AN EPOXY COMPOSITION

Leroy N. Chellis, Endwell, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 600,619, Apr. 16, 1984, Pat. No. 4,550,128. This application Sep. 20, 1985, Ser. No. 778,055
Int. Cl.[4] B05D *3/02*
U.S. Cl. 427—386 18 Claims

1. A process for preparing a laminate which comprises impregnating a fibrous substrate with a composition of:

(A) about 25 to about 30 parts by weight of a tetrabrominated diglycidyl ether of bisphenol-A having an epoxy equivalent weight of about 350 to about 450;

(B) about 10 to about 15 parts by weight of a second and different tetrabrominated diglycidyl ether of bisphenol-A having an epoxy equivalent weight of about 600 to about 750; and

(C) about 55 to about 65 parts by weight of at least one epoxidized non-linear novolak having at least six terminal epoxy groups; and then pressing together multiple layers of such an impregnate; and then curing at a temperature of about 150° C. to about 200° C. under pressure of about 300 psi for about 1 to about 5 hours.

4,597,997

FOAM PAINT SET

Linda Weill, 2 Raymond Ave., San Anselmo, Calif. 94960

Filed May 29, 1985, Ser. No. 738,926
Int. Cl.[4] B05D *1/02*
U.S. Cl. 427—288 3 Claims

1. An improved method for producing a decorative coating by applying water-based paints to a surface, said method characterized by spraying at least two water-based foam compositions having preselected different color additives to the surface by means of aerosol applicators, wherein said foam compositions and said color additives are combined in an aerosol container prior to spraying, combining the foams on the surface by spreading the foams together to vary the resulting color, and allowing the paints to dry to form a permanent image.

4,597,998

HIGH SOLIDS OIL FREE POLYESTER INDUSTRIAL PROTECTIVE COATING

Yehra A. Mostafa, 94 Hazzard St., Jamestown, N.Y. 14701

Continuation-in-part of Ser. No. 448,641, Dec. 10, 1982, abandoned. This application Nov. 13, 1984, Ser. No. 670,648
Int. Cl.[4] B05D *3/02;* C08K *5/42*
U.S. Cl. 427—387 18 Claims

15. A method of coating a substrate with a high solids composition capable of being cross-linked by heat and acid catalyst which comprises the steps of:

a. mixing in a mill, oil free polyester, cellosolve acetate, methylamyl ketone, and a wetting agent;
b. mixing a gellant of bentonite and methanol;
c. adding the gellant to the mill;
d. adding the pigments titanium dioxide, carbon back, china blue, silica and zinc phosphate to the mill;
e. operating the mill until a 6+ grinder reading is obtained;
f. preparing a let down phase in a tank by combining oil free polyester, melamine cross-linking agent, n-butyl aceteate, diisobutyl ketone, n-butanol, and butyl cellosolve; and methyl ethyl ketone (MEK).
g. mixing the contents of the let down tank at a low speed;
h. emptying the mill contents into the let down tank;
i. adding as a catalyst p-toluol sulfonic acid to the let down tank; under slow mixing;
j. adding the defoamer solution, comprising a mixture of alkylhalogensilane with methyethyl ketone, to the let down tank under slow agitation;
k. pouring the composition from the let down tank into a hot dip tank at a temperature between 110 ° and 120° F.;
l. dipping the substrate into the composition;
m. removing the coated substrate from the dip tank; and
n. baking the coated substrate at 300° to 350° F. for 20 minutes;

4,597,999

METHOD FOR COUPLING A HYDROCARBON CONTAINING MOLECULAR SPECIES

Clifford A. Lingwood, Toronto, Canada, assignor to The Hospital for Sick Children, Toronto, Canada

Filed Oct. 4, 1984, Ser. No. 657,542
Int. Cl.[4] B05D *3/06;* B01J *19/12*
U.S. Cl. 427—54.1 15 Claims

1. A method of covalently coupling two molecular species comprising:

(a) combining

(i) a first molecular species having a functionality reactive with hydrocarbon when photo-activated; and

(ii) a solution of at least one, hydrocarbon containing, molecular species

in the absence of photo-radiation to which said functionality is sensitive;

(b) removing the solvent;

(c) irradiating the mixture with photo-radiation to which said functionality is photosensitive.

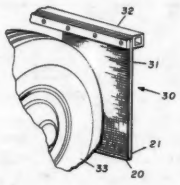
2. The method of claim 1 wherein the first molecular species is a support matrix.

4,598,000

SPRAY-SUPPRESSION DEVICE

Joseph Mantarro, Windsor, Conn., assignor to Monsanto Company, St. Louis, Mo.

Filed May 29, 1985, Ser. No. 738,917
Int. Cl.[4] B62D *25/16*
U.S. Cl. 428—17 4 Claims



1. A laminated spray-suppression device comprising a substrate layer of high density polyethylene fusion bonded to a grass-like, three-dimensional layer having a plurality of elongated blades extending from a base layer, which is a substantially uniform sheet; said three-dimensional layer comprising linear low density polyethylene.

4,598,001

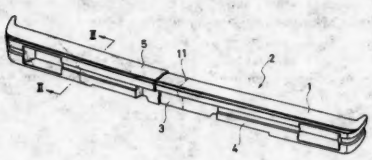
BUMPER CORE AND PROCESS PRODUCING SAME

Noboru Watanabe, Imaichi; Hisao Tokoro, Kamikawachi, and Syuichi Ohhara, Utsunomiya, all of Japan, assignors to Japan Styrene Paper Corporation, Tokyo, Japan

Filed Mar. 20, 1984, Ser. No. 591,542
Claims priority, application Japan, Mar. 24, 1983, 58-49479
Int. Cl.[4] B60R *13/04*
U.S. Cl. 428—31 10 Claims

1. A bumper core of improved dimensional accuracy comprising:

two core members of foamed polypropylene having confronting end portions tapered along the outer circumfer-



ence thereof and bonded at said confronting end portions to form a unitary bumper core.

4,598,002

CORE BAR OF STEERING WHEEL

Saburo Kimura, Toyota, Japan, assignor to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Apr. 27, 1984, Ser. No. 604,961

Claims priority, application Japan, May 2, 1983, 58-66501[U]; May 2, 1983, 58-66502[U]

Int. Cl.⁴ B62D *1/04*

U.S. Cl. 428—36 **9 Claims**

1. A core member of a steering wheel, comprising:
a ring portion formed into a hollow pipe-shaped form by bending at least one metal plate;
at least one regulating means formed from said ring portion for preventing a coating layer on said ring portion from rotating around said ring portion, said regulating means being at least one of (A) as obstructing protrusion which is at least one edge part of said metal plate and (B) a recession formed on a surface of said ring portion in contact with said layer;
a boss portion; and
at least one spoke portion connecting said ring portion and said boss portion.

4,598,003

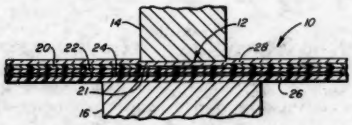
IMPRINTABLE TAPE AND METHOD FOR IMPRINTING SAME

Roy J. Renholts, 984 Customs Rd., Pebble Beach, Calif. 93953

Continuation-in-part of Ser. No. 489,528, Apr. 28, 1983, abandoned. This application Apr. 4, 1985, Ser. No. 719,741

Int. Cl.⁴ B32B *7/06, 27/06*

U.S. Cl. 428—40 **21 Claims**



1. A tape adapted for imprinting of indicia upon selected surface portions thereof, comprising an opaque film formed from polytetrafluoroethylene and having a top surface and a bottom surface, a layer of material being laminated to the bottom surface of said opaque film, said layer having a contrasting color underlying the opaque film in the selected surface portions of the tape whereby, upon application of compression force to the selected surface portions of the laminated tape, corresponding portions of said opaque film are compressed without any lateral displacement and thereby converted to a transparent condition in order to expose the underlying contrasting color of said laminated layer and thereby form the imprinted indicia.

3. The laminated tape of claim 1 further comprising an adhesive surface and a removable backing over the adhesive surface to facilitate application of the tape to a selected surface.

4,598,004

THIN FILM SURGICAL DRESSING WITH DELIVERY SYSTEM

Steven B. Heinecke, New Richmond, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 24, 1985, Ser. No. 695,042

Int. Cl.⁴ C09J *7/02;* A61F *13/02*

U.S. Cl. 428—40 **12 Claims**

1. An adhesive composite comprising a backing wherein at least one edge of the backing is a delivery strip which is separable by perforations from the remainder of the backing;
a pressure sensitive adhesive coated on at least a portion of one surface of the backing; and
a liner which is adhered to the delivery strip with sufficient tenacity to result in separation along the perforations of the delivery strip from the remainder of the backing before the liner separates from the delivery strip and which liner is releasably adhered to the remainder of the backing.

4,598,005

THERMAL INSULATION

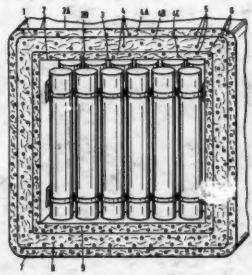
Botho Ziegenbein, Neckarsteinach, Fed. Rep. of Germany, assignor to Brown, Boveri & Cie Aktiengesellschaft, Mannheim-Kaefertal, Fed. Rep. of Germany

Filed Dec. 12, 1984, Ser. No. 681,114

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1983, 3345141

Int. Cl.⁴ B32B *1/06, 7/02, 15/14;* B65D *90/06*

U.S. Cl. 428—69 **3 Claims**



1. Thermal insulation comprising a double-walled housing, an evacuated space between the two housing walls, said space containing insulating material composed of three layers of fiber-like insulating materials which retard heat flow between

the two housing walls, each said layer is made of a different glass material and the layers are arranged contiguously in the evacuated space one behind the other perpendicularly to a temperature gradient between the two walls in which the outermost layer which adjoins the inner faces of the outer housing wall is made of fibers of alkali-lead silicate glass and is 10 mm thick, the central layer is made of fibers of soft boron silicate glass and is 15 mm thick, and the innermost layer made of hard boron silicate glass, is 5 mm thick and is contiguous to the outer faces of the inner housing wall.

4,598,006

METHOD FOR IMPREGNATING A THERMOPLASTIC POLYMER

Michael L. Sand, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed May 2, 1985, Ser. No. 729,729

Int. Cl.[4] A01N *17/08, 9/00;* **C11B** *9/00;* **C08K** *3/18*

U.S. Cl. 424—81 **9 Claims**

1. A method of forming an impregnated thermoplastic polymer, comprising:

dissolving an impregnation material in a volatile swelling agent maintained at or near supercritical conditions for the volatile swelling agent, said impregnation material being selected from the group consisting of fragrances, pest control agents and pharmaceuticals;

swelling the thermoplastic polymer by contacting it with the impregnation material-laden volatile swelling agent at or near supercritical conditions for the volatile swelling agent; and

reducing the pressure whereby the volatile swelling agent diffuses out of the impregnated thermoplastic polymer.

4,598,007

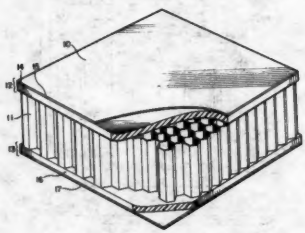
LIGHT WEIGHT FIRE RESISTANT GRAPHITE COMPOSITES

Demetrius A. Kourtides, Gilroy; John A. Parker, Los Altos, and Ming-Ta S. Hsu, San Jose, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 28, 1985, Ser. No. 706,682

Int. Cl.[4] B32B *3/12*

U.S. Cl. 428—116 **16 Claims**



1. A lightweight flame resistant composite structure comprising a fire-resistant cellular honeycomb core, having adhered to at least one of its faces a facesheet comprising a reinforced cured vinyl styrylpyridine-bismaleimide copolymer.

4,598,008

SANDWICH COMPONENT FOR THE BODYWORK OF A MOTOR VEHICLE

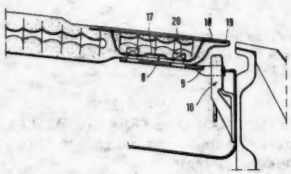
Hans Vogt, Overath, and Erwin Spiegel, Bergheim, both of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 12, 1984, Ser. No. 681,035

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1983, 3345576

Int. Cl.[4] B32B *3/12*

U.S. Cl. 428—117 **4 Claims**



1. A sandwich component, in particular for hoods, deck lids or the like, for the bodywork of a motor vehicle, the sandwich component being of the type comprising a core layer interposed between a pair of covering layers, and a reinforcement member, the core layer being recessed adjacent the reinforcement member, and the reinforcement member being joined to the covering layers and the core layer by means of plastic foam, characterized in that the reinforcement member is made dish-shaped and comprises a base provided with openings and a projecting flange provided with openings and the flange is positioned inwardly adjacent to one covering layer and the base is inwardly adjacent to the other covering layer.

4,598,009

EMBOSSED MATERIAL AND METHOD FOR PRODUCING THE SAME FROM A PHOTOCROSSLINKABLE POLYURETHANE

Peter A. Christie, Lancaster, Pa., and Charles E. Hoyle, Hattiesburg, Miss., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Sep. 13, 1984, Ser. No. 650,208

Int. Cl.[4] B05D *3/06, 5/00*

U.S. Cl. 428—172 **8 Claims**

1. A method for producing an embossed material which comprises the steps of:

(a) applying to a substrate an embossable and crosslinkable coating comprising a linear polyurethane in combination with a photoinitiator that is effective in crosslinking the polyurethane upon exposure to actinic radiation, said linear polyurethane containing unsaturated sites only in the polymeric backbone thereof;

(b) embossing the coating to thereby form a desired pattern thereon; and

(c) irradiating the embossed coating with actinic radiation to thereby crosslink the polyurethane coating and permanently fix the embossed pattern.

8. The embossed material formed by the method of claim 1.

4,598,010

METHOD OF ATTACHING A METAL COVERING TO A CEILING BOARD

James C. Ollinger, and Melvin H. Shaub, both of Lancaster, Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

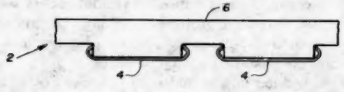
Filed Jul. 1, 1985, Ser. No. 750,120

Int. Cl.[4] E04B *1/84;* **B32B** *3/04*

U.S. Cl. 428—172 **2 Claims**

1. An acoustical tile comprising a combination of at least one metal facing sheet and a porous backing board behind said sheet, said porous backing board having at least one raised rib

having a large smooth surface with at least two parallel straight sided walls on two opposite sides of said large smooth surface, said facing sheet being sufficient to cover the large smooth surface and having at least one dimension approximately equal to the dimension of the porous backing board between the two vertical side walls, said facing sheet having two sides extending therefrom, said metal facing sheet being positioned adjacent said large smooth surface with the vertical sides of the metal facing sheet resting against only the vertical side walls of one rib of the porous backing board and holding



the metal facing sheet on the porous backing board by the frictional contact between the sides of the metal facing sheet and the side walls of one rib of the porous backing board so that if external forces are applied to lift or remove the metal facing sheet from the aforementioned raised rib, the ends of the sides of the metal facing sheet are forced into the side walls of the raised rib preventing removal of the metal facing without destruction of the raised rib, while at the same time, the metal facing sheet and backing board are free to move relative to each other as temperature and humidity cause changes in board dimensions.

4,598,011

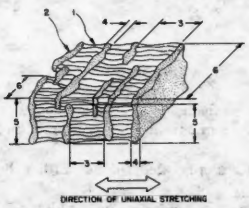
HIGH STRENGTH POROUS POLYTETRAFLUOROETHYLENE PRODUCT HAVING A COARSE MICROSTRUCTURE

Jeffery B. Bowman, 2711 W. Eddy, Flagstaff, Ariz. 86001

Continuation of Ser. No. 416,465, Sep. 10, 1982, abandoned. This application Mar. 27, 1984, Ser. No. 594,036

Int. Cl.⁴ B32B *3/00*

U.S. Cl. 428—221 **23 Claims**



1. A porous material consisting essentially of polytetrafluroroethylene polymer, which material has a microstructure characterized by nodes interconnected by fibrils and as measured along at least one direction, has a combination of average matrix tensile strength greater than about 15,000 psi and an average node height/width ratio greater than about 3.

4,598,012

GLASS FIBER REINFORCED CEMENTITIOUS PRODUCTS

Richard S. Miller, Crofton; Randall P. Bright, Bowie, both of Md.; Richard D. Vargo, Akron, Ohio, and Patricia M. Dreyfuss, Midland, Mich., assignors to Research One Limited Partnership, Towson, Md.

Filed Feb. 14, 1985, Ser. No. 701,747

Int. Cl.⁴ B32B *17/02*; **B05D** *3/02*

U.S. Cl. 428—228 **10 Claims**

1. A process for producing a glass fiber reinforcment material with a coating which is free from porosity and other surface discontinuities and which protects the glass fibers from attack by alkali when they are, exposed to an alkaline environment which process comprises:

coating a glass fiber material with a high solids small particle size SBR latex;

removing excess latex from said material leaving a coating of SBR rubber on said material;

drying said coated material;

APPLY SILANE FINISH TO GLASS
DIP INTO HIGH SOLIDS SBR LATEX
SQUEEZE TO REMOVE EXCESS LATEX AND IMPREGNATE GLASS
DRY IN FORCED AIR DRYER
DIP INTO HIGH SOLIDS NATURAL RUBBER LATEX
SQUEEZE TO FURTHER IMPREGNATE SCRIM
DRY AGAIN
DIP IN THIRD RUBBER LATEX (NATURAL RUBBER)
DRY AND CURE
APPLY TALC OR STARCH (OPTIONAL)

applying a second rubber coating to said coated material from a high solids natural rubber latex;

drying the resulting double coated material;

applying a third rubber coating to said glass material from a high solids natural rubber latex; and

drying and curing the rubber coatings on the resulting product.

4,598,013

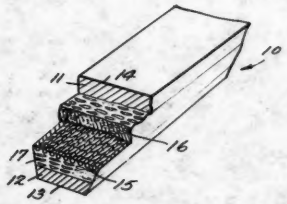
SEAMLESS PRODUCT FOR REINFORCING AND STABILIZING V-BELTS AND METHODS TO PRODUCE SAME

James N. McGee, Jr., Pleasant Garden, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Apr. 12, 1983, Ser. No. 484,367

Int. Cl.⁴ B32B *27/00*

U.S. Cl. 428—290 **4 Claims**



1. A seamless non-woven fabric for reinforcing V-belts comprising

a non-woven fabric comprising chopped fibers and having impregnated therein a first solvent solution comprising one or more rubber compounds, an isocyanate compound and an organic solvent, a second solvent solution comprising one or more rubber compounds and an organic solvent, at least 70% of said chopped fibers being oriented in the cross-machine direction of said non-woven fabric.

4,598,014

MAGNETIC RECORDING MEDIUM

Takahito Miyoshi; Kenichi Masuyama; Toshimitu Okutu; Masahiro Utumi; Masaki Fujiyama, and Minoru Kanazawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 16, 1984, Ser. No. 672,322

Claims priority, application Japan, Nov. 16, 1983, 58-215812

Int. Cl.[4] G11B *5/72*

U.S. Cl. 428—323 13 Claims

1. A magnetic recording medium comprising a non-magnetic support having provided on opposite surfaces a magnetic recording layer and a backing layer containing two types of carbon black and a binder and having a thickness of 2 μm or less, one of said carbon black being fine carbon black having an average particle size of 30 to 100 mμ and the other of said carbon black being coarse carbon black having an average particle size of 150 to 500 mμ, and the mixing weight ratio of said carbon black and the binder being 1:0.5 to 1:3.5.

4,598,015

MULTILAYER SATIN FINISH AUTOMOTIVE PAINT SYSTEM

Sol Panush, Farmington Hills, Mich., assignor to Inmont Corporation, Clifton, N.J.

Filed Dec. 11, 1984, Ser. No. 680,456

Int. Cl.[4] B32B *19/02*

U.S. Cl. 428—324 7 Claims

1. A substrate material coated with at least two layers of polymer including a base coat comprising a pigmented thermosetting or thermoplastic resin and a transparent topcoat on the base coat, wherein the transparent topcoat consists essentially of a thermoplastic or thermosetting resin containing titanium dioxide encapsulated mica particles in a particle to resin weight ratio of about 0.0001 to about 0.32, the mica particles being about 5 microns to about 150 microns nominal longitudinal dimension and having a thickness of about 0.25 micron to about 1 micron, the titanium dioxide encapsulation representing about 10% to about 85% by weight of the total weight of the particle.

4,598,016

GALVANICALLY DEPOSITED DISPERSION LAYER AND METHOD FOR MAKING SUCH LAYER

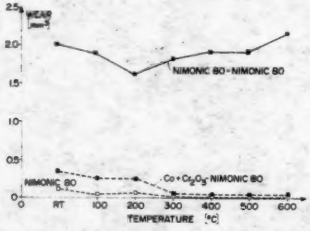
Martin Thoma, and Paul Bünger, both of Munich, Fed. Rep. of Germany, assignors to MTU Motoren-und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 23, 1984, Ser. No. 592,851

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1983, 3327346

Int. Cl.[4] C23B *5/08, 5/48, 5/52, 5/68*

U.S. Cl. 428—328 7 Claims



1. A structural component, comprising a substrate made of an alloy including elements selected from the group consisting of nickel and titanium, and a galvanically deposited dispersion layer on said substrate, said galvanically deposited dispersion layer comprising a matrix of Co_3O_4/CoO and a non-metallic dispersion phase embedded in said matrix of Co_3O_4/CoO, said non-metallic dispersion phase comprising chromic oxide (Cr_2O_3) particles of less than 10 μm in size, said galvanically deposited dispersion layer having been subjected to a heat treatment sufficient for forming said matrix of Co_3O_4/CoO.

5. A pair of structural components cooperating under wear conditions between the structural components, said pair of structural components being made of an alloy including elements selected from the group consisting of nickel and titanium, only one of said structural components of said pair having a wear protection coating thereon at least in a wear zone facing the other component of said pair without such a wear protection coating, said wear protective coating comprising a galvanically deposited dispersion layer comprising a matrix of Co_3O_4/CoO and chromic oxide (Cr_2O_3) particles of less than 10 μm in size embedded in said matrix of (Co_3O_4/CoO), said galvanically deposited dispersion layer having been subjected to a heat treatment sufficient for forming said matrix of Co_3O_4/CoO.

4,598,017

COMPOSITE MAGNETIC DISK WITH SI AND SIC SUBSTRATE

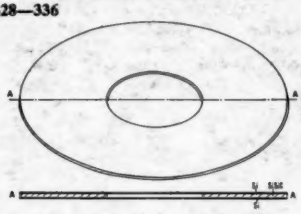
Thomas Bayer; Holger Hinkel, both of Boeblingen; Kurt Kleischmann, Wildberg; Ulrich Kuenzel, Kusterdingen, and Rolf Schäfer, Gaertringen-Rohrau, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 22, 1984, Ser. No. 612,768

Claims priority, application European Pat. Off., May 27, 1983, 83105262.6

Int. Cl.[4] G11B *5/64*

U.S. Cl. 428—336 7 Claims



1. A composite magnetic disk, comprising,
an annular core of carbon fiber-reinforced polymeric material,
a disk of reaction-bonded silicon carbide bonded to said core,
a magnetic recording layer on the outer surface of said silicon carbide disk, and
a thin layer of silicon interposed between said silicon carbide disk and magnetic layer.

4,598,018

INSULATING HIGH TEMPERATURE WIRE

Clinton J. Beuscher, Sturbridge, Mass., assignor to Galileo Electro-Optics Corp., Sturbridge, Mass.

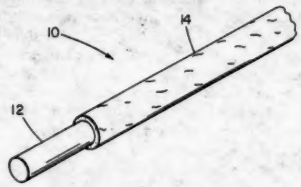
Continuation of Ser. No. 541,555, Oct. 13, 1983, abandoned, which is a continuation of Ser. No. 361,827, Mar. 25, 1982, abandoned. This application Sep. 19, 1984, Ser. No. 652,341

Int. Cl.[4] B32B *15/00;* H01B *7/00*

U.S. Cl. 428—389 6 Claims

1. An electrical wire for use in high temperature applications, said wire comprising
an electrically conductive core, and
an insulating coating of a carded mixture comprising refractory fibers that are larger than one micron in diameter and made of essentially nonmetallic mineral material that has a melting point greater than about 1200° F. and holding

fibers that are longer than the refractory fibers and are sufficiently long to hold the refractory fibers in place at



elevated temperatures and are made of a material that has a lower melting point than said refractory fibers.

4,598,019

METHOD FOR SURFACE TREATMENT OF POWDERY AND GRANULAR MATERIAL STORED IN OPEN AIR

Nobuo Yokoyama, Yokohama, Japan, assignor to Nippon Oil Company, Ltd., Japan

Filed Dec. 5, 1984, Ser. No. 678,462
Claims priority, application Japan, Dec. 6, 1983, 58-230098
Int. Cl.[4] B32B *27/14, 11/04;* C08L *91/06*
U.S. Cl. 428—407 17 Claims

1. In a method of surface treatment by applying a surface treating agent to a powdery and granular material stored in the open air, the improvement which comprises said surface treating agent being an emulsion containing 0.5 to 50% by weight of a solid content and water, said solid content comprising (I) 100 parts by weight of a petroleum wax component selected from the group consisting of slack waxes with 1% by weight or more of an oil content, slack microcrystalline waxes with 1% by weight or more of an oil content, paraffin waxes, microcrystalline waxes and mixtures thereof and (II) 5 to 500 parts by weight per 100 parts of petroleum wax component of a polymer component having adhesive properties and the lowest film-forming temperature of 40° C. or less, said polymer being acrylic or vinyl acetate polymer.

4,598,020

AUTOMOTIVE PAINT COMPOSITIONS CONTAINING PEARLESCENT PIGMENTS AND DYES

Sol Panush, Farmington Hills, Mich., assignor to Inmont Corporation, Clifton, N.J.

Filed Aug. 16, 1985, Ser. No. 766,237
Int. Cl.[4] C08K *9/02, 9/10;* C09B *45/00;* C09C *1/28*
U.S. Cl. 428—411.1 10 Claims

1. A pearlescent coating composition comprising thermoplastic or thermosetting resin containing about 1% to about 25% by weight of a pigment composition comprising about 5% to about 90% by weight of iron oxide encapsulated mica particles, wherein the improvement comprises the inclusion of about 0.5 weight percent to about 82.5 weight percent (of the pigment composition) in the coating of a metal organic complex dye selected from the group consisting of 1:2 cobalt metal organic complex dyes and 1:2 chrome metal organic complex dyes, the inclusion of such metal organic complex dyes resulting in a fade-free coating composition.

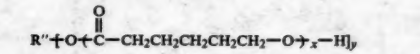
4,598,021

WEATHERABLE ABRASION RESISTANT ETHERIFIED AMINOPLAST DERIVED COATING FOR PLASTIC SUBSTRATES

James E. Moore, Mt. Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 641,914, Aug. 17, 1984, Pat. No. 4,552,936.
This application Aug. 12, 1985, Ser. No. 751,155
Int. Cl.[4] B32B *27/36*
U.S. Cl. 428—412 7 Claims

1. A protective coating on a thermoplastic substrate consisting essentially of the reaction products of:
(i) an aminoplast derived compound; and
(ii) polycaprolactone polyol of the general formula:



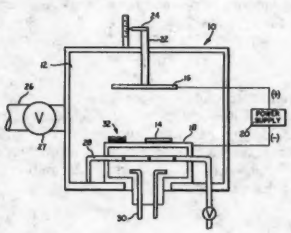
wherein R'' is a residue of a polyhydric alcohol; y is 2 or 3; x is on average greater than 3 but less than the value at which said polycaprolactone polyol is insoluble in a nonagressive solvent, and said polycaprolactone polyol has a molecular weight greater than 1000.

4,598,022

ONE-STEP PLASMA TREATMENT OF COPPER FOILS TO INCREASE THEIR LAMINATE ADHESION

Reza Haque, Hamden; Edward F. Smith, III, Madison, and Igor V. Kadija, Cheshire, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 554,465, Nov. 22, 1983, Pat. No. 4,526,806.
This application Mar. 4, 1985, Ser. No. 707,992
Int. Cl.[4] B05D *3/06, 5/10*
U.S. Cl. 428—413 7 Claims



3. A composite article comprising:
a metal or metal alloy foil having a plasma deposited polymeric film coating on at least one surface, said coating exhibiting polar characteristics for providing improved laminate adhesion; and
a layer of plastic material bonded to said at least one foil surface on which said polymeric film is deposited.

6. The article of claim 3 further comprising:
said plastic material layer being formed from a fiberglass epoxy material.

4,598,023

METHOD FOR FORMING A COATING ON A HOT VITREOUS SUBSTRATE BY SPRAYING THE SUBSTRATE WHILE HEATING THE ZONE THAT IS SPRAYED AND PRODUCT

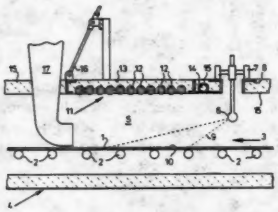
Robert Van Laethem, Loverval; Albert Van Cauter, Charleroi, and Robert Terneu, Thiméon, all of Belgium, assignors to Glaverbel, Brussels, Belgium

Filed May 9, 1984, Ser. No. 610,086

Claims priority, application United Kingdom, May 13, 1983, 8313285

Int. Cl.[4] B32B *15/00, 17/06*

U.S. Cl. 428—432 22 Claims



1. A method of forming a metal compound coating on a side of a hot vitreous substrate as it is conveyed along a substrate path through a coating station, comprising the steps of: (a) spraying coating precursor material towards the substrate by means which repeatedly traverses the substrate path, said coating precursor material being deposited on said substrate at a zone of impingement which sweeps transverse regions of the substrate and decomposing pyrolytically to form said coating in situ on said substrate; and (b) directing radiant heat from radiant heating means located on the side of the substrate being coated towards the transverse region swept by the zone of impingement of the coating precursor material on the substrate.

11. Vitreous material coated by a method according to claim 1.

4,598,024

DISPERSION TOUGHENED CERAMIC COMPOSITES AND METHOD FOR MAKING SAME

David P. Stinton, Knoxville; Walter J. Lackey, and Robert J. Lauf, both of Oak Ridge, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 28, 1984, Ser. No. 655,488

Int. Cl.[4] B32B *9/04*

U.S. Cl. 428—448 7 Claims

1. A ceramic structure comprising a ceramic substrate capable of withstanding a temperature of at least about 1,200° C. and −1,500° C. and a ceramic composite coating thereon, said coating comprising a matrix phase of silicon carbide and an intermetallic phase of titanium disilicide uniformly dispersed within said matrix.

4,598,025

DUCTILE COMPOSITE INTERLAYER FOR JOINING BY BRAZING

Howard Mizuhara, Hillsborough, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jul. 19, 1985, Ser. No. 756,526

Int. Cl.[4] B32B *15/04*

U.S. Cl. 428—450 8 Claims

1. A ceramic part joined to a metal part by means of a molybdenum copper composite interlayer therebetween, the composite being prepared by the steps of blending molybdenum powder with copper powder, forming the blend into a shape, and densifying the blend by sintering and being brazed using a brazing alloy to both the ceramic part and the metal part, the coefficient of thermal expansion of the composite being closer to the coefficient of thermal expansion of the ceramic part than to the coefficient of thermal expansion of the metal part.

6. The method of joining a ceramic part to a metal part comprising the steps of preparing a densified molybdenum copper composite having a coefficient of thermal expansion closer to that of the ceramic part than to that of the metal part, disposing the composite between the ceramic part and the metal part, and brazing the composite to both the ceramic part and the metal part said composite being prepared by the steps of blending molybdenum powder with copper powder, forming the blend into a shape, and densifying by sintering.

4,598,026

METAL WORKING USING LUBRICANTS CONTAINING BASIC ALKALI METAL SALTS

James N. Vinci, Mayfield Hts., Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Division of Ser. No. 304,526, Sep. 21, 1981, Pat. No. 4,505,830. This application Feb. 7, 1985, Ser. No. 699,105

Int. Cl.[4] B32B *15/04;* C10M *1/38*

U.S. Cl. 428—467 7 Claims

1. A metal workpiece having on the surface thereof a film of a composition comprising:

(A) a major amount of a lubricating oil;

(B) a minor amoung of a compound selected from the group consisting of a sodium metal salt of an acidic organic compound and a borated complex thereof wherein the (B) has a metal ratio of about 8 to 25 and is prepared from a reaction mixture (B-2) in which there is intimately contacted, for a period of time sufficient to form a stable dispersion, at a temperature between 25° C. and 200° C., an acid gaseous carbon dioxide material (B-1) so as to react (B-1) with the reaction mixture (B-2) comprising:

(B-2-a) an oil-soluble alkylated benzenesulfonic acid;

(B-2-b) sodium metal or a hydroxide, alkoxide, hydride or amide thereof;

(B-2-c) a lower aliphatic alcohol;

(B-2-d) a hydrocarbon-substituted succinic acid or functional derivative thereof;

(C) a sulfurization product of an aliphatic, arylaliphatic or alicyclic olefinic hydrocarbon containing from 3 to about 20 carbon atoms, the sulfurization product containing a substantial amount of active sulfur; and

(D) a chlorinated wax.

4,598,027

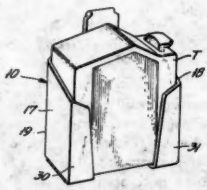
TAPE MEASURE HOLSTER

Robert L. Johnson, Cityproof Corp., 10-11 43rd Ave., Long Island City, N.Y. 11101

Filed Nov. 25, 1985, Ser. No. 801,327

Int. Cl.[4] B65D *85/671*

U.S. Cl. 428—542.8 16 Claims



7. A blank for forming a tape measure holster, said blank formed or a resilient sheet material and having:

a rear wall area having substantially parallel lateral edges;

side wall areas, one extending from each lateral edge of said rear wall area;

front flap areas, one on each side of said side wall areas;

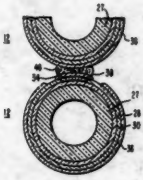
a bottom wall area having a cut-out dimensioned to permit a finger to move therethrough, said bottom walls are extending from an edge of said rear wall area between said side wall areas.

4,598,028

HIGH STRENGTH POROUS SUPPORT TUBES FOR HIGH TEMPERATURE SOLID ELECTROLYTE ELECTROCHEMICAL CELLS

Barry R. Rossing, Churchill, and Gregory E. Zymboly, Penn Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 13, 1985, Ser. No. 701,263
Int. Cl.[4] H01M 8/12
U.S. Cl. 429—30 12 Claims



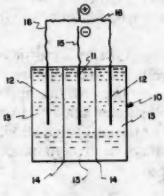
1. A high temperature electrochemical cell comprising an electrode, a separate solid oxide electrolyte and a separate porous, sintered material supporting said electrolyte and electrode, said porous, sintered material comprising a mixture of thermally stable oxide powder particles and thermally stable oxide fibers, where the oxide powder particles and the oxide fibers are sintered together in interlocking contact, said fibers being thermally stable up to about 1700° C., and comprising from about 3 wt. % to about 45 wt. % of the sintered material.

4,598,029

REVERSAL RESISTANT NON-AQUEOUS ELECTROCHEMICAL CELL

Narayan Doddapaneni, Glenside, and David L. Chua, Bridgeport, both of Pa., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 11, 1985, Ser. No. 786,931
Int. Cl.[4] H01M 10/36, 10/44
U.S. Cl. 429—50 13 Claims



1. A method of preventing voltage reversals in an anode-limited, non-aqueous electrochemical cell comprising an active metal anode, an inert cathode collector and an electrolyte comprising a solute dissolved in a compatible non-aqueous solvent depolarizer selected from the group consisting of sulfur dioxide, oxyhalides, and thiohalides, comprising the step of placing a ceramic material between said anode and said cathode providing a physical separator therebetween, wherein said ceramic material consists primarily of alumina (Al_2O_3) and silica (siO_2).

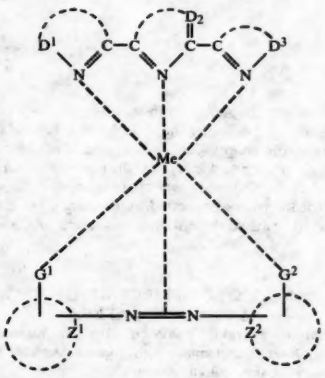
4,598,030

PHOTOGRAPHIC PRODUCTS EMPLOYING NOVEL NONDIFFUSIBLE METAL COMPLEXES OF AZO DYES

James A. Reczek, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 688,203, Jan. 2, 1985, Pat. No. 4,562,139.
This application Aug. 2, 1985, Ser. No. 761,932
Int. Cl.[4] G03C 1/40; C09B 45/00
U.S. Cl. 430—17 17 Claims

12. A photographic element comprising a support having thereon a photographic mordant having bound thereto a coordination complex having the formula:



wherein:

(a) D^1, D^2 and D^3 each independently represents the atoms necessary to complete an aromatic heterocyclic nucleus having at least one ring of 5 to 7 atoms;

(b) Z^1 and Z^2 each independently represents the atoms necessary to complete an aromatic carbocyclic or heterocyclic nucleus having at least one ring of 5 to 7 atoms or a ketomethine group;

(c) G^1 and G^2 each independently represents a metal chelating group; and

(d) Me is a polyvalent, hexacoordinate metal ion.

4,598,031

PRINTING MEMBER FOR ELECTROSTATIC PHOTOCOPYING

Shunpei Yamazaki, 21-21 Kitakarasuyama 7-chome, Setagaya-ku, Tokyo, Japan

Division of Ser. No. 502,583, Jun. 9, 1983, abandoned, which is a division of Ser. No. 276,503, Jun. 23, 1981, Pat. No. 4,418,132.
This application Mar. 29, 1984, Ser. No. 594,685
Claims priority, application Japan, Jun. 25, 1980, 55-86801
Int. Cl.[4] G03G 5/082, 5/14
U.S. Cl. 430—57 6 Claims

1. A printing member for electrostatic photocopying, comprising:

a substrate having a conductive surface; and

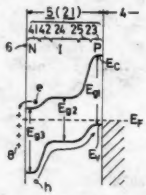
a photoelectrically sensitive, electrically chargeable layer on the conductive surface of the substrate;

wherein the photoelectrically-sensitive, electrically chargeable layer has a non-single crystal semiconductor layer on the substrate;

wherein the non-single crystal semiconductor layer has a first layer on the substrate, a second layer on the first layer to create a first transition region and a third layer on the second layer to create a second transition region where each of the first, second, and third layers is formed principally of Si, $Si_3N_{4-x}(0<x<4)$, $SiC_{1-x}(0<x<1)$, or Si-

$O_{2-x}(0<x<2)$ and contains hydrogen, chlorine, or fluorine; the first and third layers having a larger energy band gap than the second layer;

wherein the first layer is P or N type, the second layer is I type, the third layer is N or P type depending on whether the first layer is P or N type, the first transition region is PI or NI type depending on whether the first layer is P or



N type, and the second transition region is IN or IP type depending on whether the third layer is N or P type; and wherein the energy band gap structure of the non-single crystal semiconductor layer in the direction from the third layer to the first layer is wide-to-narrow-to-wide so that electrical carriers generated by incident light are rapidly directed towards the conductive surface of the substrate.

4,598,032

PHOTOCONDUCTIVE MEMBER WITH A-SI; A-(SI/GE) AND A-(SI/C) LAYERS

Keishi Saitoh, Ibaraki; Yukihiko Ohnuki, Kawasaki, and Shigeru Ohno, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1984, Ser. No. 686,939

Claims priority, application Japan, Dec. 29, 1983, 58-250269; Dec. 30, 1983, 58-246523; Dec. 31, 1983, 58-246735

Int. Cl.[4] G03G 5/082

U.S. Cl. 430—58 **26 Claims**

1. A photoconductive member comprising a substrate for photoconductive member and a light-receiving layer exhibiting photoconductivity, said light-receiving layer having a layer constitution in which a first layer (I) comprising an amorphous material containing silicon atoms, a second layer (II) comprising an amorphous material containing silicon atoms and germanium atoms and a third layer (III) comprising an amorphous material containing silicon atoms and carbon atoms are successively provided from the substrate side, and the germanium atoms contained in said second layer (II) being distributed ununiformly in the direction of the thickness said layer and being present in amounts from 1 to 9.5×10^5 atomic ppm and wherein hydrogen atoms and/or halogen atoms are contained in both the first layer (I) and the second layer (II); and wherein the content of hydrogen and/or halogen atoms (i) in the first layer (the sum of both when both are contained) is 1 to 40 atomic % and (ii) the content of the hydrogen atoms and/or halogen atoms contained in the second layer (ii) (the sum of both when both are contained) is 0.01 to 40 atomic %.

4,598,033

PHOTOCONDUCTIVE COMPOSITIONS COMPRISING A DISAZO COMPOUND

Kouichi Kawamura; Seiji Horie; Naonori Makino, and Hideo Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

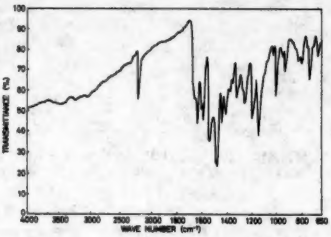
Filed Oct. 12, 1984, Ser. No. 660,572

Claims priority, application Japan, Oct. 13, 1983, 58-191244

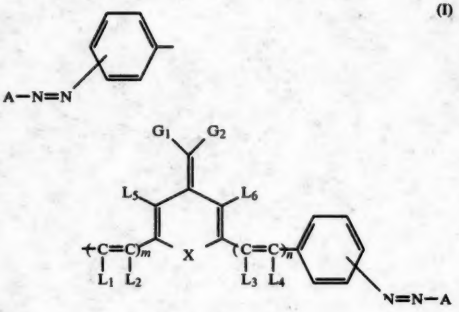
Int. Cl.[4] G03G 5/06

U.S. Cl. 430—75 **47 Claims**

1. A photoconductive composition comprising at least one disazo compound represented by the following general formula (I):



(I)



wherein

X represents O, S, Se or NR, wherein R represents a substituted or unsubstituted alkyl, aryl, aralkyl, cycloalkyl, alkoxy, aryloxy, acyl, alkenyl, alkynyl or alkylene group, and the substituent is hydroxy, alkoxy, aryloxy or halogen;

m and n, which may be the same or different, each represents 0, 1 or 2;

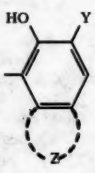
L_1, L_2, L_3 and L_4, which may be the same or different, each represents a hydrogen atom, an alkyl group or an aryl group, or L_2 or L_3 represents an atomic group necessary to complete a carbon ring together with L_5 or L_6;

L_5 and L_6 each represents a hydrogen atom or an atomic group necessary to complete a carbon ring together with L_2 or L_3;

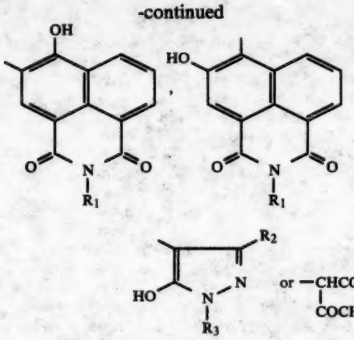
G_1 and G_2, which may be the same or different, each represents an electron attracting group or a non-metal atomic group necessary to form a carbon or heterocyclic ring including the carbon atom to which G_1 and G_2 are bonded;

provided that when G_1 and G_2 form a cyclic carbon nucleus or a heterocyclic nucleus together with the carbon atom to which they are bonded, the ring formed may be substituted with a substituent selected from the group consisting of substituted or unsubstituted alkyl, aryl, aralkyl, cycloalkyl, alkenyl, alkynyl, dialkylamino, diarylamino and diaralkylamino groups;

A represents

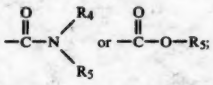


-continued



wherein Z represents an atomic group necessary to form an aromatic ring or a heterocyclic ring (which may be substituted or unsubstituted) said ring being condensed with the benzene ring;

Y represents



R_1 represents a hydrogen atom, a substituted or unsubstituted alkyl group or a substituted or unsubstituted phenyl group;

R_2 represents a hydrogen atom, a lower alkyl group, a carbamoyl group, a carboxyl group, an alkoxycarbonyl group, an aryloxycarbonyl group or a substituted or unsubstituted amino group;

R_3 and R_5 each represents a hydrogen atom, an alkyl group, an aromatic group, a heteroaromatic group, or an alkyl, aromatic or heteroaromatic substituted group; and

R_4 represents a hydrogen atom, a substituted or unsubstituted alkyl group or a substituted or unsubstituted phenyl group.

4,598,034

FERRITE CARRIERS FOR ELECTROPHOTOGRAPHIC DEVELOPMENT

Toshio Honjo, Abiko, and Yukio Seki, Kashiwa, both of Japan, assignors to Nippon Iron Powder Co., Ltd., Kashiwa, Japan

Continuation-in-part of Ser. No. 525,562, Jan. 25, 1984, abandoned. This application Jan. 7, 1985, Ser. No. 689,400

Claims priority, application Japan, Sep. 13, 1982, 57-158207

Int. Cl.[4] G03G *9/10, 9/00*

U.S. Cl. 430—106.6 **12 Claims**

1. A carrier for electrophotographic development comprising essentially a disintegrated powder of granules consisting essentially of the compound represented by the formula:

$$(CuO)_a(ZnO)_b(Fe_2O_3)_c$$

in which $a(\text{mol})+b(\text{mol})+c(\text{mol})=1$ and $0.42 \leqq (a+b)/c \leqq 0.85$.

4,598,035

HEAT-SENSITIVE RECORDING MATERIAL CONTAINING MICROCAPSULES CONTAINING COLORING COMPONENT(S) AND ORGANIC SOLVENT

Toshimasa Usami, and Toshiharu Tanaka, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 26, 1985, Ser. No. 716,301

Claims priority, application Japan, Mar. 26, 1984, 59-59231

Int. Cl.[4] B32B *7/02;* **G03C** *1/52, 5/24*

U.S. Cl. 430—138 **20 Claims**

1. A heat-sensitive recording material comprising a support having thereon a layer containing microcapsules containing at least a first component capable of causing a coloring reaction as a core material, and at least a second component causing said coloring reaction with said first component in the microcapsules, wherein the microcapsules contain an organic solvent in the cores thereof, the average particle size of the microcapsules is 0.1 to 8 microns, and the value of (number average wall thickness δ (in microns)/volume average particle size D (in microns)) of the microcapsules is 1×10^{-2} to 5×10^{-1}.

4,598,036

PRINT-OUT COMPOSITIONS

Masayuki Iwasaki; Minoru Maeda; Fumiaki Shinozaki, all of Shizuoka, and Sadao Ishige, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

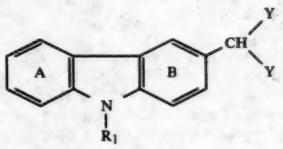
Filed Sep. 10, 1984, Ser. No. 649,002

Claims priority, application Japan, Sep. 8, 1983, 58-165405

Int. Cl.[4] G03C *1/52, 1/68*

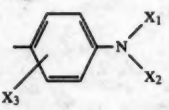
U.S. Cl. 430—270 **9 Claims**

1. A print-out composition containing a leuco dye, a photooxidizing agent and a light curing component, said leuco dye being at least one carbazomethane compound represented by formula (I)



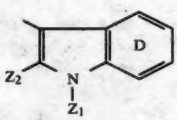
(I)

wherein Y represents an amino group-substituted phenyl group represented by formula (Ia)



(Ia)

or an indolyl group represented by formula (Ib)



(Ib)

wherein X_1 and X_2 each represents a hydrogen atom, an unsubstituted alkyl group, or an alkyl group substituted by a halogen atom, a hydroxy group, a cyano group, or a lower alkoxy group, said alkyl group having up to 12 carbon atoms, a cycloalkyl group, a phenyl group, a benzyl group, or a phenyl or benzyl group substituted by a halogen atom, a lower alkyl group, or a lower alkoxy group, or said X_1 and X_2 together may form a 5-membered or 6-membered heterocyclic group

together with the nitrogen atom bonded thereto; X_3 represents a hydrogen atom, a halogen atom, a nitro group, a lower alkyl group, or a lower alkoxy group; R_1 and Z_1 each represents a hydrogen atom, an alkyl group having up to 12 carbon atoms unsubstituted or substituted by a halogen atom, a hydroxy group, a cyano group, or a lower alkoxy group, an alkenyl group having up to 12 carbon atoms, an acyl group having from 1 to 12 carbon atoms, a phenyl group, a benzyl group, or a phenyl or benzyl group substituted by a member selected from the group consisting of a halogen atom, a lower alkyl group, a lower alkoxy group, and a nitro group; Z_2 represents a hydrogen atom, a lower alkyl group, or a phenyl group; and rings A, B, and D each may be further substituted by a cyano group, a nitro group, a halogen atom, a lower alkyl group, a lower alkoxy group, or a lower alkylcarbonyl group.

4,598,037

PHOTOSENSITIVE CONDUCTIVE METAL COMPOSITION

John J. Felten, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 21, 1984, Ser. No. 685,028

Int. Cl.[4] G03C *5/44*

U.S. Cl. 430—281 **4 Claims**

1. A photosensitive conductive metal coating composition which is fireable in a weakly oxidizing atmosphere comprising an admixture of:

a. Smooth finely divided particles of conductive metal, at least 80% wt. of which (1) have an aspect ratio of no more than 2 and (2) have a particle size of 2–6 μm, and

b. Finely divided particles of cadmium-containing lead aluminosilicate glass having a softening point of 500°–600° C., at least 80% wt. of which have a particle size of 2–6 μm, the admixture of a. and b. being dispersed in a solution of

c. Acrylic polymer binder,

d. Volatile plasticizer,

e. A photoinitiation system and

f. Photohardenable monomer having at least one addition-polymerizable ethylenically unsaturated group, the plasticizer comprising from 10 to 30% wt. of the polymeric binder and the monomer comprising from 20 to 33% wt. of the polymeric binder.

4,598,038

PREPARATION OF POLYIMIDE AND POLYISOINDOLOQUINAZOLINE DIONE RELIEF STRUCTURES

Hellmut Ahne, Röttenbach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 27, 1985, Ser. No. 716,673

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1984, 3411697

Int. Cl.[4] G03C *1/70*

U.S. Cl. 430—283 **15 Claims**

1. A method for the preparation of a highly heat resistant polyimide or polyisoindoloquinazoline dione relief structure which comprises applying a radiation-sensitive soluble polymer precursor to a substrate in the form of a film or foil, irradiating the film or foil through a negative pattern using actinic light or using electrons or a light, electron, ion or laser beam, and removing the unirradiated or unexposed film or foil portion, wherein the polymer precursor is a polycondensation product of a diamino compound or a diamino compound having at least one ortho-positioned amido group and an olefinically unsaturated tetracarboxylic acid diester of an aromatic and/or heterocyclic tetracarboxylic acid dianhydride and an olefinically unsaturated alcohol which polycondensation product is prepared using a carbodiimide to cause the condensation reaction.

4,598,039

FORMATION OF FEATURES IN OPTICAL MATERIAL

Frederick H. Fischer, Allentown; Edmond J. Murphy, Bethlehem, and Trudie C. Rice, North Whitehall Township, Lehigh County, all of Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 2, 1984, Ser. No. 627,025

Int. Cl.[4] G03C *5/00*

U.S. Cl. 430—323 **30 Claims**

1. A method of making an article characterized by steps comprising:

(1) forming a surface pattern in an optical material by a first application of radiant electromagnetic energy that selectively removes a surface layer of said optical material, and

(2) subsequently removing at least one additional layer of optical material underlying said surface layer by at least one additional application of radiant electromagnetic energy at a power density below the threshold at which a surface layer is removed from said optical material.

4,598,040

PHOTOGRAPHIC SYSTEM AND PROCESS

Yoel Netz, 5 Massada Street, Bat-Yam, and Arnold Hoffman, 5 Hagra Street, Rehovot, both of Israel

Continuation-in-part of Ser. No. 318,921, Nov. 6, 1981, abandoned. This application Sep. 12, 1983, Ser. No. 531,611

Claims priority, application Israel, Nov. 16, 1980, 61497

Int. Cl.[4] G03C *5/24, 1/02*

U.S. Cl. 430—405 **15 Claims**

1. A developer which comprises a development agent, a pH buffer for maintaining the pH within a predetermined range during the development process, a salt of an organic sulfinic acid compound of the formula $HO\text{-}R\text{-}SO_2.M \times H_2O$ wherein R is a hydrocarbyl groups, M is a metal cation or metal cation equivalent, or a compound which upon dissociation in an aqueous medium yields an active species of this type; formaldehyde or a source thereof other than the organic sulfinic acid salt, and an anti-fogging agent.

5. In a process for developing a film wherein the film is exposed in conjunction with a continuous tone original, and the exposed film is developed with a developer, the improvement which comprises exposing the film in conjunction with a continuous tone original in the absence of a screen and wherein the developer comprises a development agent, a pH buffer for maintaining the pH within a predetermined range during the development process, a salt of an organic sulfinic acid compound of the formula $HO\text{-}R\text{-}SO_2.M \times H_2O$ wherein R is a hydrocarbyl group, M is a metal cation or metal cation equivalent, or a compound which upon dissociation in an aqueous medium yields an active species of this type; formaldehyde or a source thereof other than the organic sulfinic acid salt, and an anti-fogging agent.

4,598,041

SELF-PROCESSING PHOTOGRAPHIC FILM UNIT WITH DISSOLVABLE TRAP MEMBER

Yoshio Hara, Kanagawa, and Yoshiaki Ishino, Shizuoka, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 28, 1984, Ser. No. 687,285

Claims priority, application Japan, Dec. 28, 1983, 58-245571

Int. Cl.[4] G03C *3/00, 5/39*

U.S. Cl. 430—498 **13 Claims**

1. A self-processing photographic film unit comprising:

a first sheet member for recording a positive image thereon;

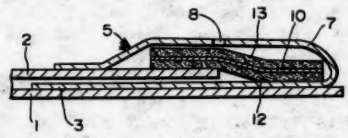
a second, transparent sheet member;

a bonding member for uniting said first and second sheet members in superimposed relationship;

container means for storing an aqueous alkaline processing liquid therein; and

trap means for trapping any excess of said aqueous alkaline processing liquid from an image recording area of said

first sheet member, said trap means being gas permeable and including therein a trap member of solid phase absor-



bent macromolecular material that swells and dissolves upon contact with water.

4,598,042

IMMUNOASSAY WITH AN INCREASING CYCLIC DETECTION SYSTEM

Colin H. Self, 46 Lensfield Road, Cambridge CB2 1EG, United Kingdom

Continuation of Ser. No. 307,600, Oct. 1, 1981, Pat. No. 4,446,231, which is a continuation-in-part of Ser. No. 193,647, Oct. 3, 1980, abandoned. This application Dec. 8, 1983, Ser. No. 559,489

Claims priority, application United Kingdom, Oct. 3, 1979, 7934376

The portion of the term of this patent subsequent to May 1, 2001, has been disclaimed.

Int. Cl.[4] G01N *33/54, 33/543;* C12Q *1/42, 1/32*

U.S. Cl. 435—7 **33 Claims**

1. In an immunoassay in which a conjugate of a phosphatase is contacted with a phosphate of an organic compound which is thereby dephosphorylated causing a determinable change which is determined, the improvement which comprises employing as the phosphate of the organic compound a phosphate of a nicotinamide adenine dinucleotide whereby a nicotinamide adenine dinucleotide is produced by the conjugate of a phosphatase which is contacted with the components of a cyclic chemical reaction which is activated by the nicotinamide adenine dinucleotide, which cyclic chemical reaction interconverts said nicotinamide adenine dinucleotide and its reduced form and thereby regenerates said nicotinamide adenine dinucleotide and produces a determinable change. said components of the cyclic chemical reaction being present in sufficient quantity to maintain the cyclic chemical reaction and produce determinable change as the cyclic chemical reaction proceeds, whereby amplification occurs.

4,598,043

METHOD FOR QUANTITATIVELY ASSAYING BLOOD COAGULATION FACTOR XII IN HUMAN PLASMA

Lars G. Svendsen, Reinach, Switzerland, assignor to Pentapharm AG, Basel, Switzerland

Filed Oct. 28, 1982, Ser. No. 437,207

Claims priority, application Switzerland, Nov. 2, 1981, 6972/81

Int. Cl.[4] C12Q *1/56;* C07K *5/08*

U.S. Cl. 435—13 **6 Claims**

1. A method for quantitatively assaying blood coagulation factor XII directly from human blood plasma which comprises

(a) contacting unpurified human blood plasma with an activator in order to quantitatively convert any factor XII present in the plasma to factor XIIa;

(b) reacting the unpurified plasma which contains unpurified factor XIIa with a tripeptide derivative having the general formula

H-D-X-Gly-Arg-R^1

wherein the R^1 radical is a chromogenic or fluorogenic substituted amino group which is cleavable by the enzymatic action of factor XIIa, and X represents an amino acid selected from the group consisting of α-aminobutyric acid, norvaline, leucine, norleucine, phenyalanine, tyrosine, hexahydrophenylalanine and hexahydrotyrosine, or with a mineral or organic acid salt of the tripeptide derivative; and

(c) measuring the quanitity of colored or fluorescent split product R^1H released enzymatically from the tripeptide derivative or salt thereof by factor XIIa by photometric, spectrophotometric or fluoresence-spectrophotometric methods, so as to quantitatively assay blood coagulation factor XII directly from human blood plasma.

4,598,044

ENHANCED LUMINESCENT OR LUMINOMETRIC ASSAY

Larry J. Kricka; Gary H. G. Thorpe, both of Birmingham, and Thomas P. Whitehead, Leamington Spa, all of England, assignors to National Research Development Corporation, London, England

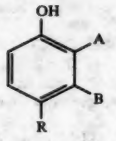
Filed Feb. 9, 1984, Ser. No. 578,783

Claims priority, application United Kingdom, Feb. 11, 1983, 8303820; Apr. 20, 1983, 8310721

Int. Cl.[4] G01N *33/53, 33/564;* C12Q *1/66, 1/28*

U.S. Cl. 435—28 **15 Claims**

1. In a luminescent or luminometric assay which comprises carrying out a chemiluminescent reaction between a peroxidase enzyme, an oxidant, and a chemiluminescent 2,3-dihydro-1,4-phthalazinedione and measuring or detecting the chemiluminescence thereby produced, the improvement wherein the reaction is carried out in the presence of a phenolic compound of the formula:



(I)

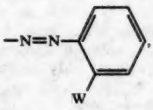
wherein:

(i) A and B are hydrogen; and

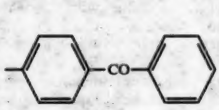
R is halogen;

phenyl;

being $—CH_2—$, —O— or —N=N— and V being hydrogen or Y being —O—, —S— or —S—S— and V being hydroxy;

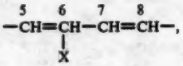


W being hydrogen or carboxy;

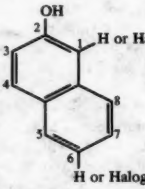


—CH=CH—Z, Z being carboxy or 2,4-dinitrophenyl; $—CH_2CH_2COOC_2H_5$; or C_1–C_6 alkyl;

(ii) A is hydrogen;
B is halogen or C_{1-6} alkyl; and
R is halogen;
(iii) A is halogen;
B is hydrogen; and
R is halogen or phenyl; or
(iv) A is hydrogen or halogen;
R and B together represent a naphthalene nucleus-completing chain which, read in the direction from R to B, is of formula



X being hydrogen or halogen, whereby the compound of formula (I) is a beta-naphthol of formula:



and "halogen" in every occurrence in (i) through (iv) above means chlorine, bromine or iodine.

4,598,045

TRIPHASIC MYCOPLASMATALES DETECTION METHOD

Gerald K. Masover, Palo Alto, and Milton G. Drysdale, Concord, both of Calif., assignors to Hana Biologics, Inc., Berkeley, Calif.

Continuation of Ser. No. 411,293, Aug. 25, 1982, abandoned. This application Feb. 19, 1985, Ser. No. 703,627
Int. Cl.[4] C12Q *1/04*; C12N *1/20*; C12M *1/24, 1/16*
U.S. Cl. 435—34 **11 Claims**

1. A method for detecting Mycoplasmatales in a sample with a triphasic culture device comprising a container having first and second, opposed, transparent sidewalls, an opening and a closure means for sealing the opening, the inner wall surface of the first sidewall being covered with an adherent layer of Mycoplasmatales nutrient agar medium, the container also containing a Mycoplasmatales liquid nutrient medium and a gas phase, the nutrient agar medium being spaced apart from the liquid nutrient medium with the gas phase in between the mediums when the first sidewall is positioned in a horizontal plane above the second sidewall, the distance between the outer surfaces of the first and second sidewalls and the surface quality of the first sidewall permitting microscopic examination of the nutrient medium through the first sidewall, said method comprising

(a) introducing inhibitory quantities of a thallium salt and a cell-wall inhibiting antibiotic through the opening in the container, inoculating the Mycoplasmatales nutrient agar medium and the Mycoplasmatales liquid nutrient medium with a sample, and closing the opening to seal the container;
(b) incubating the container at a temperature of from 35° to 37° C. for at least 48 hours with the container oriented to maintain the nutrient agar medium spaced apart from the liquid nutrient medium with the gas phase between the mediums;
(c) inoculating the Mycoplasmatales nutrient agar medium with the Mycoplasmatales liquid nutrient medium in the container without unsealing the container;
(d) reincubating the container at a temperature of from 35° to 37° C. for at least 48 hours with the container oriented to maintain the nutrient agar medium spaced apart from the liquid nutrient medium with the gas phase between the mediums; and
(e) examining the Mycoplasmatales nutrient agar medium through the first sidewall with a microscope without unsealing the container to detect Mycoplasmatales colonies therein.

4,598,046

MUTANT STRAIN OF *ESCHERICHIA COLI* AND ITS USE FOR THE PREPARATION OF GLUTATHIONE

Akira Kimura, 80-2, Wakamiya-dori 6-jo-agaru, Kamiwakamiya-cho, Shimogyo-ku, Kyoto-shi, Kyoto-fu, and Kousaku Murata, 3-35, Nishino Hitsugawa-cho, Yamashina-ku, Kyoto-shi, Kyoto-fu, both of Japan

Continuation of Ser. No. 402,697, Jul. 28, 1982, abandoned. This application Jan. 10, 1985, Ser. No. 690,385
Claims priority, application Japan, Jul. 30, 1981, 56-120546
Int. Cl.[4] C12P *21/02*; C12N *15/00, 11/18, 1/20*
U.S. Cl. 435—70 **8 Claims**

1. A mutant strain *Escherichia coli* RC 912p (FERM-BP 48) which produces γ-glutamyl-L-cysteine synthetase which is not inhibited by glutathione and glutathione synthetase, and is thereby capable of producing glutathione.

4,598,047

PHENYLALANINE AMMONIA LYASE-PRODUCING MICROBIAL CELLS

Jeffrey C. McGuire, Frederick, Md., assignor to Genex Corporation, Rockville, Md.

Filed Jun. 25, 1984, Ser. No. 624,285
Int. Cl.[4] C12P *13/22*; C12N *9/88, 1/36, 1/20, 1/16*
U.S. Cl. 435—108 **9 Claims**

1. A biologically pure culture of catabolite resistant, PAL-producing microorganism which is capable of growing on a minimal essential nutrient medium containing normally inhibiting amounts of 2-deoxyglucose and which contains, as substantially the sole carbon source, a nutritional amount of L-phenylalanine.

9. A method for producing L-phenylalanine which comprises cultivating under growth-promoting conditions, the microorganism of claim 1, 2, 3, 4, 5, 6, 7 or 8 on a nutritional medium containing assimilable sources of carbon, nitrogen and essential minerals and growth factors; inducing the production of PAL in said microorganism by contacting it with L-phenylalanine or a PAL-inducing analog of L-phenylalanine under PAL-inducing conditions; and contacting the PAL so produced with t-cinnamic acid and ammonium ions under L-phenylalanine producing conditions.

4,598,048

PREPARATION OF A MALTOGENIC AMYLASE ENZYME

Boerge K. Diderichsen, Hellerup, and Lars Christiansen, Lyngby, both of Denmark, assignors to Novo Industri A/S, Denmark

Filed Mar. 20, 1984, Ser. No. 591,461
Claims priority, application Denmark, Mar. 25, 1983, 1359/83
Int. Cl.[4] C12N *15/00, 9/26*
U.S. Cl. 435—172.3 **14 Claims**

1. A process for preparing a maltogenic amylase enzyme wherein a transformed host microorganism containing the gene coding for the maltogenic amylase produced by Bacillus strain NCIB 11837 is cultivated in a suitable nutrient medium containing carbon and nitrogen sources and inorganic salts followed by recovery of the maltogenic amylase enzyme from the culture broth.

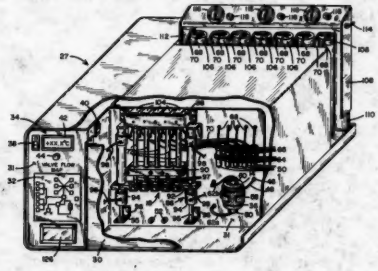
12. A recombinant plasmid containing the gene coding for the maltogenic amylase produced by Bacillus strain NCIB 11837.

4,598,049

GENERAL PURPOSE GENE SYNTHESIZER

Richard J. Zelinka, Lino Lakes, Minn.; Keiichi Itakura, Arcadia, Calif.; Carl W. Sims, St. Paul, Minn., and Bruce E. Kaplan, Claremont, Calif., assignors to Systec Inc., Minneapolis, Minn.

Filed Aug. 31, 1983, Ser. No. 528,053
Int. Cl.[4] C12M *1/00, 1/36;* B67D *5/52;* G05B *17/00*
U.S. Cl. 435—287 22 Claims



1. Oligonucleotide synthesizing apparatus comprising:

a bottom-fed reaction cell for containing substrate supported seed nucleotides;

a plurality of chemical supply reservoirs for containing certain predetermined bases, reagents and solvents to be used in a synthesis process;

means coupled to said chemical supply reservoirs and to said bottom-fed reaction cell for selectively dispensing one or more of said predetermined bases, reagents, and/or solvents at predetermined times and in predetermined controlled volumes, said bases, reagents and/or solvents dispensing means including a plurality of injectors that are simultaneously actuable, whereby selected ones of said injectors dispense to said bottom-fed reaction cell when the injectors are actuated in a first direction, while the nonselected ones of said injectors dispense to said chemical supply reservoirs, and thereby all of said injectors are simultaneously refilled upon actuation in a second direction;

means for programming a plurality of subroutines corresponding to the sequential steps of the nucleotide synthesizing process and storage means for entering and storing said subroutines as programmed;

means for programming, entering and storing a desired oligonucleotide sequence to be synthesized;

processing means responsive to said programmed, entered and stored sequence and said stored subroutines for selectively actuating said dispensing means so as to subject said seed nucleotides to said bases, reagents, and solvents in a sequential fashion and whereby said programmed, entered and stored oligonucleotide sequence is grown in said bottom-fed reaction cell.

4,598,050

CULTURE PLATE FOR SURFACES

Lewis R. Brown, 5 Hialeah Dr., Starkville, Miss. 39759

Filed Dec. 2, 1983, Ser. No. 557,447
Int. Cl.[4] C12M *1/22*
U.S. Cl. 435—298 4 Claims

1. In a device for collecting microorganisms from surfaces and culturing them comprising

a top lid,

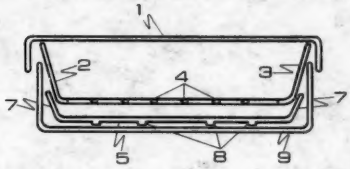
a first receptacle with a rim and having an agar-holding structure and agar flow-through means in it,

a second receptacle with a rim and a flat, impermeable bottom, and

a bottom lid,

the improvement which comprises

means for joining the first receptacle to the second receptacle whereby, when melted agar is poured into the first receptacle and allowed to solidify, a flat agar surface which extends beyond the bottom of the first receptacle is formed.



4,598,051

LIPOSOME CONJUGATES AND DIAGNOSTIC METHODS THEREWITH

Demetrios P. Papahadjopoulos, Lafayette, and Timothy D. Heath, San Francisco, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 129,654, Mar. 12, 1980. This application Oct. 29, 1981, Ser. No. 316,126
Int. Cl.[4] G01N *33/53, 33/554, 33/555, 33/563*
U.S. Cl. 436—512 8 Claims

1. A method for determining the presence of an analyte in a solution, where the analyte is either free or present on the surface of agglutinatable particulate bodies, said method comprising adding to said solution an agglutinating reagent, and determining analyte according to the degree of agglutination of said particulate bodies or, in the case where said analyte is free in said solution, according to the degree of agglutination of analyte-competing agglutinatable particulate bodies also added to said solution, characterized in that said agglutinating reagent is comprised of lipid vesicles having antibody molecules which are covalently bound to lipid molecules in the vesicles, said bound antibody molecules being capable of binding to analyte or analyte analog molecules, and being present on said lipid vesicle surfaces in an average amount of at least about 40 micrograms per micromole of lipid vesicle molecules.

4,598,052

ALUMINA BASE SUBSTRATE OF RECORDING HEAD AND PROCESS FOR THE PRODUCTION THEREOF

Toshiaki Wada, Takatsuki; Mitsuhiko Furukawa, Fukuoka; Mitsuyoshi Nagano, Saga; Michito Miyahara, Nakagawa, and Shigeki Mori, Tosu, all of Japan, assignors to Sumitomo Special Metals Co., Ltd., Osaka and Nippon Tungsten Co., Ltd., Fukuoka, both of, Japan

Filed Apr. 29, 1985, Ser. No. 728,223
Claims priority, application Japan, May 1, 1984, 59-88128
Int. Cl.[4] C04B *35/10, 35/46, 35/56*
U.S. Cl. 501—87 19 Claims

1. An alumina base substrate material for recording heads, which comprises a densely sintered body consisting essentially of:

per 100 parts by weight of a base component of 30 to 40% by weight of a mixture of carbide and oxide of titanium having a TiO_2 to ($TiC+TiO_2$) percentage of 5 to 15% by weight and the balance being Al_2O_3,

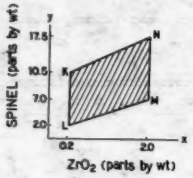
components A, B and C, provided that the A to B ratio is within a hatched KLMN area in FIG. 1, in the following given parts by weight, and

oxidic impurities in amounts of no higher than 0.2% by weight based on the total composition,

said sintered body having an average crystal grain size of no

higher than 1.3 microns, a porosity per area of no higher than 0.5%, a bending strength of at least 70 kg/cm^2 and a hardness H_RA of at least 93.0: wherein

component A is at least one of spinels expressed by RO-Al_2O_3, where R is at least one of Mg, Mn, Ni and Co, in an amount of 2.0 to 17.5 parts by weight,



component B is ZrO_2 in an amount of 0.2 to 2.0 parts by weight, and

component C is a Y_2O_3 in an amount of 0.05 to 2.0 parts by weight.

4,598,053

CERAMIC COMPACTS

Akira Yamakawa, and Eiji Kamijo, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 27, 1985, Ser. No. 706,166

Claims priority, application Japan, Feb. 27, 1984, 58-36774

Int. Cl.[4] C04B *35/48*

U.S. Cl. 501—104 **4 Claims**

1. A ceramic compact consisting essentially of 55 to 96% by volume of a first component, 4 to 45% by volume of a second component and at most 3% by volume of unavoidable impurities:

First Component: ZrO_2 consisting of at least 80% by weight of at least one of tetragonal system and cubic system and the balance of monoclinic system, in which at least one member selected from the group consisting of oxides of Group IIIa elements of the Periodic Table, CaO, MgO, and mixtures thereof are dissolved to form a solid solution,

Second Component: at least one member selected from the group consisting of carbonitrides, oxycarbides, oxynitrides and carboxynitrides of Group IVa, Va and VIa elements of the Periodic Table, and mixtures or solid solutions thereof.

4,598,054

CERAMIC MATERIAL FOR A HONEYCOMB STRUCTURE

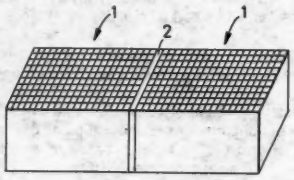
Shigeru Mochida, Kasugai; Shunichi Yamada, Nagoya, and Toshiyuki Hamanaka, Suzuka, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Dec. 26, 1984, Ser. No. 686,144

Claims priority, application Japan, Dec. 28, 1983, 58-249788

Int. Cl.[4] C04B *35/04*

U.S. Cl. 501—112 **4 Claims**



1. A ceramic material for joining, coating or sealing a honeycomb structure comprising, per 100 parts by weight, a first mixture of 20 to 80 parts by weight of cordierite powder and 20 to 80 parts by weight of a ceramic powder having a crystalline phase consisting essentially of a solid solution of SiO_2 - Al_2O_3 - Fe_2O_3 - TiO_2 - MgO, said first mixture having a chemical composition consisting essentially of 15.7 to 44.0% by weight of SiO_2, 29.8 to 41.0% by weight of Al_2O_3, 0.9 to 8.3% by weight of Fe_2O_3, 7.0 to 35.9% by weight of TiO_2 and 4.9 to 16.1% by weight of MgO said first mixture being fired at a temperature between 1300° to 1450° C. to result in a fired body, said fired body having a crystalline phase consisting essentially of said cordierite and said solid solution, said fired body having a coefficient of thermal expansion of not greater than 1.6×10^{-6}/°C. at a temperature of 40°–800° C.

4,598,055

METHOD OF MANUFACTURING CERAMIC SINTERED BODIES

Detlev F. K. Hennings, Aachen; Rolf P. Janssen, Hamburg, both of Fed. Rep. of Germany, and Piet Reijnen, Moresnet-Chapelle, Belgium, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 8, 1985, Ser. No. 720,780

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1984, 3413585

Int. Cl.[4] C04B *35/46*

U.S. Cl. 501—137 **12 Claims**

1. A method of manufacturing ceramic sintered bodies, said method comprising the steps of:

providing a starting material which forms the basic crystal lattice of the ceramic, said starting material having an average crystallite size;

mixing with the basic starting material a melt phase-forming compound, said melt phase-forming compound and said basic starting material forming a melt phase during sintering, said melt phase-forming compound not being incorporated into the crystal lattice of the ceramic during sintering;

adding to the mixture of basic starting material and melt phase-forming compound nuclei of presintered basic starting material, said presintered nuclei having an average crystallite size at least three times the average crystallite size of the basic starting material, said presintered nuclei being added in a quantity of at least 0.1% by weight of the basic starting material; and

sintering the mixture to form ceramic bodies.

4,598,056

MATERIAL CONTAINING MICROAGGREGATES OF METALS, INORGANIC COMPOUNDS OR ORGANOMETALLIC COMPOUNDS, MORE PARTICULARLY USABLE IN HETEROGENEOUS CATALYSIS AND ITS PRODUCTION PROCESS

André Barraud, Bures-sur-Yvette; Jean Leloup, Gif sur Yvette, and Annie Ruaudel, Verrières le Buisson, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 11, 1984, Ser. No. 680,354

Claims priority, application France, Dec. 12, 1983, 83 19841

Int. Cl.[4] B01J *35/02*

U.S. Cl. 502—4 **25 Claims**

1. A material incorporating microaggregates of a metal, an inorganic or organometallic compound, wherein it comprises a membrane constituted by either at least one monomolecular layer of organic amphiphilic molecules having both hydrophilic and hydrophobic groups, or by said organic amphiphilic molecules adsorbed on a substrate; and microaggregates of a metal, an inorganic compound or an organometallic compound retained on or in said membrane.

4,598,057

REGENERATION OF SOLUBLE MOLYBDENUM CATALYSTS FROM SPENT CATALYST STREAMS

Bruce H. Isaacs, Newtown Square, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 26, 1984, Ser. No. 665,234
Int. Cl.[4] B01J 38/68; C07D 333/02
U.S. Cl. 502—24 14 Claims

1. The process of regenerating a soluble molybdenum composition to obtain a stable catalyst solution capable of being employed as a catalyst in the process for the epoxidation of an olefin with an organic hydroperoxide which comprises thermally precipitating and separating a molybdenum-containing solid containing up to about 50 percent by weight, of molybdenum from a spent catalyst stream obtained from a molybdenum-catalyzed olefin epoxidation reaction, solubilizing said precipitated solid to form a soluble molybdenum composition by contacting at a temperature in the range of from about 20° C. to 130° C. with an admixture comprising a peroxy compound, present in a weight ratio to thermally precipitated solid of 1:2 to 1:20, a mono-hydroxy alcohol present in an amount of at least about 25 parts per part of molybdenum to be solubilized and an organic dicarboxylic acid containing of from 2 to 18 carbon atoms present in an amount of at least about 0.2 parts by weight, per part of molybdenum contained in the solid to be solubilized, and removing any undesired solid material remaining with the said solubilized molybdenum composition.

2. The process of claim 1 wherein said peroxy compound is a member selected from the group consisting of an organic hydroperoxide, an organic peracid and hydrogen peroxide.

4,598,058

MOLDED CATALYST MATERIALS CONTAINING REDUCED COBALT AND/OR NICKEL PARTICLES

Gerhard Frank, Hirschberg; Gerald Neubauer, Weinheim; Paul Duffner, Ludwigshafen, and Hans J. Wilfinger, Schifferstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 31, 1985, Ser. No. 696,792
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1984, 3403377
Int. Cl.[4] B01J 23/78, 23/74, 27/185; C07C 85/12
U.S. Cl. 502—183 5 Claims

1. A molded catalyst material containing metallic cobalt and/or nickel particles and from 1 to 5% by weight of graphite, wherein the said metallic particles are obtained by reduction of cobalt oxide and/or nickel oxide particles having particle size of from 0.1 to 5 μm and containing less than 0.1% by weight of alkali metal oxides and/or alkaline earth metal oxides, at ≦500° C. to a degree of reduction greater than 95% and the molded catalyst material has an indentation hardness greater than 300 kp/cm^2.

3. A molded catalyst material as claimed in claim 1, which additionally contains manganese, chromium and/or copper.

4. A molded catalyst material as claimed in claim 1, which additionally contains pyrophosphoric and/or polyphosphoric acid.

4,598,059

PROCESS FOR THE IN SITU FLUORINATION OF A CATALYST

Frans Goudriaan, Amsterdam; Timothy S. Hake; Peter Ladeur, both of The Hague, all of Netherlands; Patrique Moureaux, Grand-Couronne; Jean-Paul Saint, Petit-Couronne, both of France, and Nicolaas van Dijk, The Hague, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 27, 1985, Ser. No. 706,370
Claims priority, application France, Feb. 28, 1984, 84 03049
Int. Cl.[4] B01J 27/12
U.S. Cl. 502—228 12 Claims

1. A process for the in situ fluorination of a catalyst by contact of said catalyst with a predetermined amount of a gaseous organic fluorine compound by a multiple sequential process which comprises:

(a) passing a first gas stream comprising hydrogen through a reactor containing said catalyst and injecting into said first gas stream said amount of said gaseous organic fluorine compound;

(b) withdrawing a second gas stream, as a recycle gas stream, containing hydrogen and said gaseous organic fluorine compound from said reactor and periodically injecting therein said gaseous organic fluorine compound at a rate which exceeds the sum of the rate at which physical adsorption of said gaseous organic fluorine compound occurs on said catalyst;

(c) recycling said second gas stream to said reactor to further contact said hydrogen and said gaseous organic fluorine compound with said catalyst;

(d) maintaining said catalyst during fluorine compound adsoprtion thereon at a temperature less than 145° C. for a period of time to effect that more than 50% of the amount of said gaseous fluorine compound injected in step (a) is physically adsorbed on the catalyst; and

(e) maintaining said catalyst at a higher temperature value of from 160° C. to 225° C. after said point of absorption of more than 50% of said fluorine compound on said catalyst has been reached.

11. The process of claim 1 wherein the catalyst to be fluorinated contains alumina and at least one metal of Groups 6b, 7b and 8 of the Periodic Table of the Elements.

12. The process of claim 11 wherein the catalyst to be fluorinated contains molybdenum and/or tungsten and, in addition, nickel and/or cobalt.

4,598,060

PROCESS FOR THE PREPARATION OF WIDE PORE CATALYSTS

Galeon W. Schoenthal, Houston, and Lynn H. Slaugh, Cypress, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 28, 1985, Ser. No. 695,493
Int. Cl.[4] B01J 21/04, 21/08, 21/12
U.S. Cl. 502—263 10 Claims

1. A process of preparing a catalyst composition which comprises:

(a) reacting carbon black with one or more catalytically active metal species,

(b) initially slurrying the reacted carbon black particles with an alumina- and/or silica-containing gel,

(c) drying the product of step (b),

(d) calcining the product of step (c) at an elevated temperature sufficient to convert the gel to an oxide, and

(e) burning out the carbon black in an oxygen-containing atmosphere.

4,598,061

CATALYST FOR THE SYNTHESIS OF METHANOL AND ALCOHOL MIXTURES CONTAINING HIGHER ALCOHOLS AND METHOD OF MAKING THE CATALYST

Michael Schneider, Ottobrunn-Riemerling; Karel Kochloefl, Moosburg, and Ortwin Bock, Landshut-Kumhausen, all of Fed. Rep. of Germany, assignors to Süd-Chemie Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 25, 1985, Ser. No. 694,986
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1984, 3403491
Int. Cl.[4] B01J 21/04, 23/06, 23/10, 23/72
U.S. Cl. 502—303 22 Claims

1. A catalyst, active in the reduced state for the synthesis of alcohol mixtures containing methanol and higher aliphatic alcohols from CO and H_2, and obtained from a metallic oxide catalyst precursor mixture which comprises

A. copper oxide and zinc oxide, transformable upon reduction into a catalytically-active state;

B. aluminum oxide, derived from a colloidally-dispersed aluminum hydroxide sol or gel;

C. an alkali metal compound in which the alkali content is about $13–130 \times 10^{-6}$ gram atoms of alkali metal per gram of metallic oxide precursor mixture; and

D. in which the pores of said metallic oxide precursor mixture, having a diameter in the range of from about 7.5–14 nm constitute about 20–70% of the total volume of pores of said metallic oxide precursor.

4,598,062

IRON OXIDE-CHROMIUM OXIDE CATALYST AND PROCESS FOR HIGH TEMPERATURE WATER-GAS SHIFT REACTION

Michael Schneider, Ottobrunn-Riemerling; Joachim Pohl, Düsseldorf; Karel Kochloefl, Moosburg, and Ortwin Bock, Landshut, all of Fed. Rep. of Germany, assignors to Süd-Chemie Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 16, 1984, Ser. No. 610,746

Claims priority, application Fed. Rep. of Germany, May 18, 1983, 3318131

Int. Cl.[4] B01J *21/10, 23/26, 23/78, 23/86*

U.S. Cl. 502—306 **19 Claims**

1. A high-temperature water-gas shift reaction catalyst, which comprises:

A. a major portion of iron oxide;

B. a minor portion of chromium oxide;

C. a minor portion of magnesium oxide, in the range of from 4 to 6% by weight, in which at least a portion of said magnesium oxide is chemically combined in the form of a spinel with the oxides of iron or chromium, said spinel having a crystallite size in the range of from 100 to 180 Å; and

D. a nickel and cobalt concentration of less than 200 ppm.

4,598,063

SPIRAL CATALYST SUPPORT AND METHOD OF MAKING IT

William B. Retallick, 1432 Johnny's Way, West Chester, Pa. 19382

Filed Aug. 9, 1985, Ser. No. 763,975

Int. Cl.[4] B01J *35/04*

U.S. Cl. 502—439 **23 Claims**

1. A metal catalyst support comprising a plurality of layers of metal spirally wound over each other, the layers being wound so that adjacent layers do not nest together, the support having a first taper that narrows toward one end of the support, and a second taper that narrows toward the other end so that the layers of the support cannot telescope in either direction.

4,598,064

ALPHA-ALPHA CROSS-LINKED HEMOGLOBINS

Joseph A. Walder, Iowa City, Iowa, assignor to University of Iowa Research Foundation, Iowa City, Iowa

Filed Jun. 27, 1984, Ser. No. 625,360

Int. Cl.[4] A61K *35/14;* **C07K** *13/00*

U.S. Cl. 514—6 **11 Claims**

1. A pharmaceutical composition for use as a blood substitute and blood plasma expander comprising a therapeutically effective amount of Lys 99 $Alpha_1$ to Lys 99 A^1pha_2 intramolecularly cross-linked, stroma-free hemoglobin, substantially free of hemoglobin modified at other sites, soluble in aqueous and physiological fluids and capable of reversibly binding oxygen, and a pharmaceutically acceptable carrier.

4,598,065

USE OF PEPTIDES AS MEDICAMENTS AND CERTAIN NOVEL PEPTIDES

Behrend F. Lündt, Kokkedal; Karin D. Jorgensen, Vedbaek; Nils L. Johansen, Copenhagen; Frederik C. Gronvald, Vedbaek; Erik K. Frandsen, Charlottenlund; Alister J. Moody, Lyngby, and Jan Markussen, Herlev, all of Denmark, assignors to Novo Industri A/S, Denmark

Filed Jun. 30, 1981, Ser. No. 279,153

Claims priority, application Denmark, Jul. 1, 1980, 2831/80

Int. Cl.[4] A61K *37/02*

U.S. Cl. 514—12 **4 Claims**

1. A method for exerting a spasmolytic effect with not more than negligible metabolic effect which comprises administering to a host in need of such treatment an effective amount of a peptide having the following formula:

$$R^1—R^2 \qquad (I)$$

wherein R^1 represents

His—Ser—Gln—Gly—Thr—Phe—Thr—Ser—Asp—Tyr—
5 10
Ser—Lys—Tyr—Leu—Asp—Ser—Arg—Arg—Ala—
15
Gln—Asp—,
20

and R^2 represents OH, Phe, Val, Gln, Trp, Leu, Met, Asn, Thr, the peptide chain

—Phe—Val—Gln—Trp—Leu,
25

or —Met—Asn—Thr, or a pharmaceutically acceptable salt of said peptide.

4,598,066

ANTIMYCOPLASMAL AGENT FOR ANIMALS AND METHOD OF USE FOR PREVENTION AND TREATMENT OF MYCOPLASMOSIS

Hirofumi Takagi; Kiyohiko Kunugita; Hideki Sawai, all of Sakura, and Kazuo Kariyone, Kyoto, all of Japan, assignors to Fujisawa Pharmaceutical Co., 5 Ltd. 5, Osaka, Japan

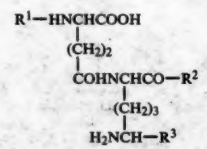
Filed Sep. 23, 1983, Ser. No. 535,332

Claims priority, application United Kingdom, Oct. 11, 1982, 8228988

Int. Cl.[4] C07K *5/06, 7/02*

U.S. Cl. 514—18 **6 Claims**

1. An antimycoplasmal composition for prevention and treatment of mycoplasmosis in animals, which comprises an effective antimycoplasmal amount of an acyl peptide of the formula



wherein

R^1 is lactoyl-alanyl, R^2 is carboxymethylamino and R^3 is carboxy; or

R^1 is heptanoyl, R^2 is 1-carboxyethylamino and R^3 is carboxy; or

R^1 is stearoyl, R^2 is 1-carboxyethylamino and R^3 is hydrogen.

or its non-toxic salt, and an antibiotic selected from the group consisting of tylosin, tetracyclines, chloramphenicol, tiamulin and spectinomycin, wherein the ratio of the acyl peptide or its non-toxic salt and the antibiotic is 1:10–50 by mol.

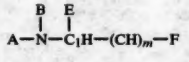
4,598,067

ANTIULCER COMPOUNDS

Sun H. Kim, Chestnut Hill, Mass., assignor to Biomeasure, Inc., Hopkinton, Mass.

Filed Oct. 16, 1984, Ser. No. 661,354
Int. Cl.[4] A61K *37/43*; C07K *5/08*
U.S. Cl. 514—19 **5 Claims**

1. A compound having the formula



or a pharmaceutically acceptable salt thereof;
wherein A is N—Ac—Sar;
B is an aryl group, a heteroaryl group, a cycloalkyl group, an aralkyl group, a heteroalkyl group, a heteroaralkyl group, a benzoyl group, an alkyl group, an acetyl group, or a substituted aryl group wherein said substituent is halogen, hydroxy, alkoxy, nitro, cyano, or hdroxyalkyl;
E is H or an alkyl group, B and E being separate substituents or, together with C_1 and the nitrogen atom to which B is attached, forming a 5, 6, or 7-membered ring; m is O; F is

wherein R is an alkoxy group or an aralkoxy group.

4,598,068

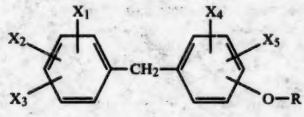
BENZYLPHENYL OSIDES, METHOD OF PREPARATION AND USE THEREFOR

Soth Samreth, Longvic; Francois Bellamy, Saulon La Rue, and Jean-Bernard Chazan, Dijon, all of France, assignors to Societe de Recheres Industrielles, Paris, France

Filed Jul. 18, 1984, Ser. No. 632,009
Claims priority, application France, Jul. 20, 1983, 83 11982
Int. Cl.[4] A61K *31/70*
U.S. Cl. 514—25 **10 Claims**

1. Benzyl-phenyl xylosides selected from the group consisting of:

(i) compounds corresponding to general formula:



(I)

in which:

X_1, X_2, X_3, X_4 and X_5, which are identical or different, each represent a hydrogen atom, a halogen atom, a C_1–C_4 alkyl group, a C_1–C_4 alkyl group substituted by one or more halogen atoms, an OH group, a C_1–C_4 alkoxy group, a C_1–C_4 alkoxy group substituted by one or more halogen atoms, a nitro group, a group NR′R″ (in which R′ and R″, which are identical or different, each represent the hydrogen atom, a C_1–C_4 alkyl group or an acetyl group) a methylthio group, a methylsulfinyl group or a mesyl group, and —R represents a radical xylose substituted with at least one acyl group

(ii) their acid addition salts in cases where at least one of the groups X_1, X_2, X_3, X_4, X_5 represents the group NR′R″.

4,598,069

METHOD OF TREATING HYPOGLYCEMIA USING ALOES POLYSACCHARIDES

Hiroshi Hikino, Sendai, and Teruaki Hayashi, Kawanishi, both of Japan, assignors to Toyo Yakushoku Kogyo Co. Ltd., Tokyo, Japan

Filed Apr. 1, 1985, Ser. No. 718,082
Claims priority, application Japan, Apr. 5, 1984, 59-67943
Int. Cl.[4] A61K *31/715*
U.S. Cl. 514—54 **5 Claims**

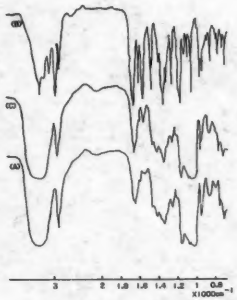
1. A method of treating diabetes which comprises administering to a patient afflicted with diabetes a therapeutically effective amount of a hypoglycemic composition which contains as an effective component a polysaccharide contained in aloes of the family Liliaceae and having hypoglycemic activity and water solubility.

4,598,070

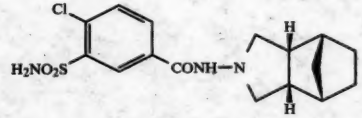
TRIPAMIDE AND CYCLODEXTRIN INCLUSION COMPOUND

Takayuki Ohwaki, Aichi; Shigeru Sakashita; Masahiro Kawahara, both of Gifu; Aishin Shinoda, and Yasuo Miyake, both of Aichi, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Jul. 18, 1984, Ser. No. 631,997
Claims priority, application Japan, Jul. 21, 1983, 58-131846
Int. Cl.[4] A61K *31/73*
U.S. Cl. 514—58 **3 Claims**



1. An inclusion compound composed of tripamide represented by formula:



and from 1.0 to 3 moles cyclodextrin per mole of tripamide.

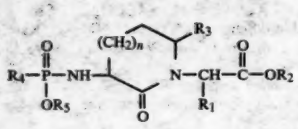
4,598,071

CERTAIN 3-PHOSPHINYL-AMINO-2-OXO-1H-AZOCINE OR AZONINE-1-ACETIC ACID DERIVATIVES HAVING ANTI-HYPERTENSIVE PROPERTIES

Donald S. Karanewsky, East Windsor, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 479,429, Mar. 28, 1983, Pat. No. 4,533,661. This application Nov. 28, 1984, Ser. No. 675,913
Int. Cl.[4] C07F *9/65*; A61K *31/395*
U.S. Cl. 514—79 **9 Claims**

1. A compound of the formula

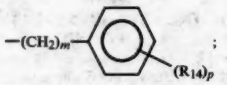


wherein

R_1 is hydrogen, lower alkyl, amino substituted lower alkyl, hydroxy substituted lower alkyl, or halo substituted lower alkyl;

n is 3 or 4;

R_3 is hydrogen, lower alkyl, $-(CH_2)_m$-cycloalkyl, or

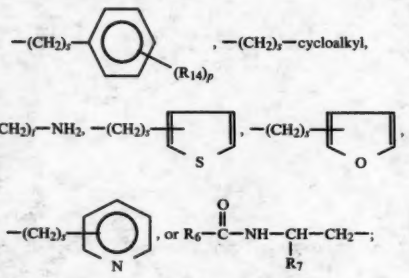


m is zero or an integer from 1 to 4;

R_{14} is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, halo, trifluoromethyl, or hydroxy;

p is an integer from 1 to 3 provided that p is more than one only if R_{14} is hydrogen, methyl, methoxy, chloro, or fluoro;

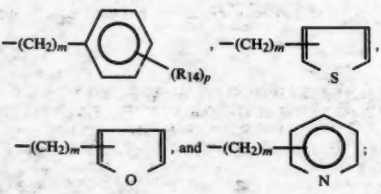
R_4 is alkyl of 1 to 10 carbons,



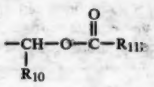
s is zero or an integer from 1 to 7;

t is an integer from 1 to 8;

R_6 and R_7 are independently selected from the group consisting of lower alkyl, halo substituted lower alkyl, $-(CH_2)_m$-cycloalkyl,



R_5 and R_2 are independently selected from the group consisting of hydrogen, lower alkyl, benzyl, benzhydryl, physiologically acceptable salt forming ion, and



R_{10} is hydrogen, lower alkyl, cycloalkyl, or phenyl; and

R_{11} is hydrogen, lower alkyl, lower alkoxy, cycloalkyl, phenyl, benzyl, or phenethyl.

4,598,072

COMBINATIONS OF AN AROMATASE-INHIBITOR AND AN ANTIANDROGEN FOR PROPHYLAXIS AND/OR TREATMENT OF BENIGN PROSTATIC HYPERPLASIA

Hans-Udo Schweikert, Bonn-Roettgen; Ulf Tunn; Theodor Senge, both of Castrup-Rauxel, and Friedmund Nümann, Berlin, all of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 307,332, Sep. 30, 1981, abandoned, and a continuation-in-part of Ser. No. 307,331, Sep. 30, 1981, abandoned. This application Dec. 10, 1982, Ser. No. 448,673

Claims priority, application United Kingdom, May 10, 1982, 8213407

Int. Cl.[4] **A01N** *45/00;* **A61K** *31/56*

U.S. Cl. 514—170 **47 Claims**

1. A pharmaceutical composition comprising an aromatase-inhibitor and an antiandrogen in a weight ratio of the aromatase-inhibitor to the antiandrogen of from about 20:1 to about 1:1, wherein the total amount of active ingredients is effective for the prophylaxis or treatment of benign prostatic hyperplasia, and wherein the aromatase inhibitor possesses essentially no hormonal effects and products of the aromatization therewith in the patient possess essentially no hormonal effects.

4,598,073

CERTAIN POLYCYCLO-PALLADIUM-BIPYRIDINE COMPLEXES HAVING ANTI-TUMOR ACTIVITY

George R. Newkome, Baton Rouge, La., assignor to Research Corporation, New York, N.Y.

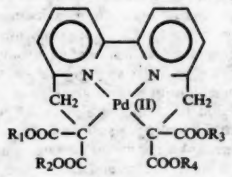
Continuation-in-part of Ser. No. 447,109, Dec. 6, 1982, abandoned, which is a continuation of Ser. No. 276,047, Jun. 22, 1981, abandoned, which is a continuation of Ser. No. 141,318, Apr. 18, 1980, abandoned. This application Jul. 29, 1983, Ser. No. 518,672

Int. Cl.[4] **C07F** *7/00;* **A61K** *31/28*

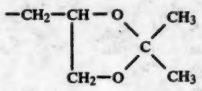
U.S. Cl. 514—185 **22 Claims**

1. A coordination complex of palladium (II) having the formula:

(VII)

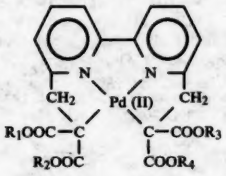


wherein: R_1, R_2, R_3, R_4 are lower alkyl groups, fluoro substituted lower alkyl groups, ar(lower)alkyl, or

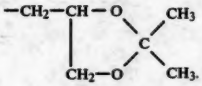


12. A pharmaceutical composition in unit dosage form adapted for the treatment of animal tumor cells sensitive to a complex of palladium (II) comprising a pharmaceutically acceptable carrier and an anti-tumor effective amount of a coordination complex of palladium (II) having the formula:

(VII)



wherein: R_1, R_2, R_3, R_4 are lower alkyl groups, fluoro substituted lower alkyl groups, ar(lower)alkyl, or



4,598,074
β-LACTAM ANTIBIOTICS

George Andreescu, Middlesex; Dennis E. Clark, Basking Ridge, and William J. Kerr, Somerville, all of N.J., assignors to Beecham Group P.L.C., England

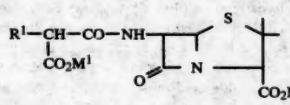
Continuation-in-part of Ser. No. 434,704, Oct. 15, 1982, abandoned. This application May 2, 1983, Ser. No. 490,441

Int. Cl.[4] A61K *31/43;* C07D *499/14*

U.S. Cl. 514—196 15 Claims

1. A process for preparing a penicillin salt selected from the group consisting of a salt of the Formula (I):

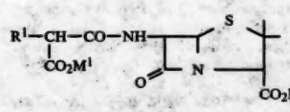
(I)



wherein M^1 and M^2 are the same or different and each is a monovalent salt forming cation, and R^1 is 3-thienyl at least 60% of which has the R-configuration at C-10 and such a salt at least 60% of which has the S-configuration at C-10 which comprises allowing crystalization from a solution in methanol or ethanol as appropriate of a mixture the R- and S-isomers and thereafter separating the R- or S-isomer.

4. A pharmaceutical composition useful for treating bacterial infections in humans and animals which comprises a β-lactamase inhibitory amount of a β-lactamase inhibitor and an antibacterially effective amount of a penicillin salt selected from the group consisting of a salt of the Formula (I):

(I)



wherein M^1 and M^2 are the same or different and each is a monovalent salt forming cation, and R^1 is 3-thienyl, at least 60% of which has the R-configuration at C-10 and such a salt at least 60% of which has the S-configuration at C-10 in combination with a pharmaceutically acceptable carrier.

4,598,075
CEPHALOSPORIN COMPOUNDS

Toyonari Oine; Hiroshi Sugano, both of Nara; Yoshihisa Yamada, Kyoto; Totaro Yamaguchi, Urawa, and Satoshi Ohshima, Iwatsuki, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Jul. 21, 1983, Ser. No. 516,053

Claims priority, application United Kingdom, Aug. 7, 1982, 8222823

Int. Cl.[4] C07D *499/44;* A61K *31/545*

U.S. Cl. 514—203 14 Claims

1. The compound 7β-{(Z)-2-(2-aminothiazol-4-yl)-2-[(2-pyrrolidon-3-yl)oxyimino]acetamido}-3-(1-pyridiniomethyl)-3-cephem-4-carboxylate or a pharmaceutically acceptable salt thereof.

4,598,076
2-PYRROLIN-3-CARBONITRIL-DERIVATIVES, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM AND THEIR ANTI-INFLAMMATORY AND ULCER PROTECTIVE ACTIVITY

Hubert Barth, Emmendingen; Edgar Fritschi, St. Peter; Volker Ganser, Freiburg; Johannes Hartenstein, Stegen-Wittental; Manfred Herrmann, St. Peter, and Gerhard Satzinger, Denzlingen, all of Fed. Rep. of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 478,762, Mar. 25, 1983, Pat. No. 4,517,185. This application Jan. 14, 1985, Ser. No. 691,026

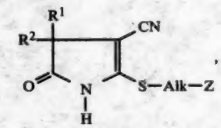
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1982, 3212591

Int. Cl.[4] C07D *207/277, 413/12;* A61K *31/40, 31/535*

U.S. Cl. 514—230 3 Claims

1. A compound of the formula

(I)



wherein R_1 is phenyl, R_2 is thienyl, or R_1 and R_2 are both thienyl, in which rings are optionally substituted by up to two halogen atoms, C_{1-4}-alkoxy radicals, C_{1-4}-dialkylamino radicals or trifluoromethyl radicals, Alk is a straight-chained or branched C_{1-4}-alkylene chain, and Z is a hydrogen atom, with the provisional that when Alk is a straight-chain alkylene, Z can also be an amino radical of the formula:

(II)

in which R_3 and R_4 are the same or different and are hydrogen atoms or methyl, ethyl, n-propyl or isopropyl radicals, or together with a nitrogen atom to which they attached form a pyrrolidino, piperidino, morophilino, or piperazino radical.

4,598,077

AMIDINE DERIVATIVES AND CARDIOTONIC COMPOSITIONS

Setsuro Fujii, Toyonaka; Takuo Sato, Chiba; Hiroyuki Kawamura, Ichikawa; Takashi Yaegashi, Yachiyo; Masateru Kurumi, Narita, and Takuo Aoyama, Sakura, all of Japan, assignors to Torii & Co. Ltd., Tokyo, Japan

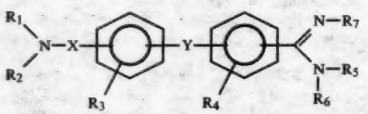
Filed Dec. 14, 1984, Ser. No. 681,476

Claims priority, application Japan, Dec. 16, 1983, 58-237715

Int. Cl.[4] A61K *31/155, 31/535;* **C07C** *123/00;* **C07D** *295/14*

U.S. Cl. 514—233 **2 Claims**

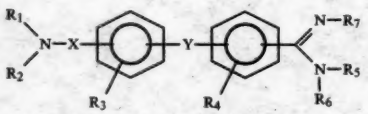
1. A compound represented by the following formula [I] or a salt thereof:



wherein R_1 and R_2, which may be the same or different, represent each a hydrogen atom or a lower alkyl group, or R_1 and R_2 together with an intermediary carbon atom and/or hetero atom may form a ring; X represents

(wherein R_8 represents a hydrogen atom, a lower alkyl group, or $—CH_2COOR_9$, where R_9 represents a hydrogen atom or a lower alkyl group; Z represents a single bond, $—CH_2—$, $—CH_2CH_2—$, or $—CH=CH—$); R_3 represents a hydrogen or chlorine atom, methoxy group, nitro group, or amino group; Y represents $—CH_2CH_2—$, $—CH=CH—$, $—CH_2O—$, or $—OCH_2—$; R_4 represents a hydrogen atom, methoxy group, benzoyl group, nitro group, or amino group; and R_5, R_6 and R_7, which may be the same or different, represent each a hydrogen atom, lower alkyl group, cycloalkyl group, aralkyl group, substituted alkyl group, substituted aralkyl group, or amino group, or R_5 and R_7 may form an imidazoline ring or a methyl substituted imidazoline ring.

2. A cardiotonic agent comprising as active ingredient an amidine derivative represented by the following formula [I] or a salt thereof:



wherein R_1 and R_2, which may be the same or different, represent each a hydrogen atom or a lower alkyl group, or R_1 and R_2 together with an intermediary carbon atom and/or hetero atom may form a ring; X represents

(wherein R_8 represents a hydrogen atom, or a lower alkyl group; Z represents a single bond, $—CH_2—$, $—CH_2CH_2—$, or $—CH=CH—$); R_3 represents a hydrogen or chlorine atom, methoxy group, nitro group, or amino group; Y represents $—CH_2CH_2—$, $—CH=CH—$, $—CH_2O—$, or $—OCH_2—$; R_4 represents a hydrogen atom, methoxy group, benzoyl group, nitro group, or amino group; and R_5, R_6 and R_7, which may be the same or different, represent each a hydrogen atom, lower alkyl group, cycloalkyl group, aralkyl group, substituted alkyl group, substituted aralkyl group, or amino group, or R_5 and R_7 may form an imidazoline ring or a methyl substituted imidazoline ring, in association with a pharmaceutically acceptable carrier.

4,598,078

N-(SUBSTITUTED PIPERAZINYL) ALKYLBICYCLIC SUCCINIMIDE DERIVATIVES

Kikuo Ishizumi, Toyonaka; Fujio Antoku, Takarazuka, and Yukio Asami, Kitamoto, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

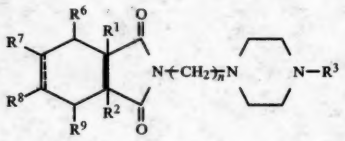
Filed Oct. 19, 1983, Ser. No. 543,496

Claims priority, application Japan, Oct. 21, 1982, 57-185649

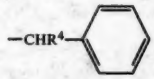
Int. Cl.[4] C07D *403/04;* **A61K** *31/495*

U.S. Cl. 514—252 **18 Claims**

1. A succinimide compound of the formula:



wherein R^1 and R^2 are each hydrogen or C_1–C_4 alkyl, or they may form a single bond; R^3 is a phenyl group, a phenyl group mono-substituted with C_1–C_4 alkyl C_1–C_4 alkoxy, halogen or trifluoromethyl, a 2-pyridyl group, a 2-pyridyl group mono-substitued with halogen, a 2-pyrimidyl group, a 2-pyrimidyl group mono-substituted with halogen, a group of the formula:



(in which R^4 is hydrogen or phenyl), a group of the formula: CO—R^5 (in which R^5 is adamantyl or furyl) or hydroxy(C_2–C_4)alkyl; R^6, R^7, R^8 and R^9 are each hydrogen or methyl; n is an integer of 3 to 5; a full line accompanying a broken line (-----) indicates a single or double bond or an acid addition salt thereof.

4,598,079

2-(ARYL SUBSTITUED)PIPERAZINONES AND NOOTROPIC COMPOSITIONS BASED THEREON

Rudi Beyerle; Heinz Bender, both of Frankfurt am Main; Ursula Schindler, Mörfelden-Walldorf; Rolf-Eberhard Nitz, Frankfurt am Main, and Piero A. Martorana, Bad Homburg, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

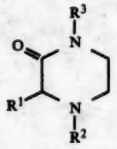
Continuation of Ser. No. 408,031, Aug. 13, 1982, abandoned. This application May 15, 1984, Ser. No. 610,921

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1981, 3132882

Int. Cl.[4] C07D *241/02, 409/04, 403/04;* **A61K** *31/495*

U.S. Cl. 514—252 **14 Claims**

1. A compound of the formula

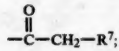


(I)

wherein

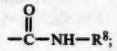
R^1 is phenyl, mono-, di- or tri-substituted phenyl, any substituent of substituted phenyl being independently selected from the group consisting of alkoxy having from 1 to 4 carbon atoms, fluoro, alkoxyalkyl having a total of from 2 to 6 carbon atoms or dialkylaminoalkoxy having a total of from 4 to 8 carbon atoms;

R^2 is hydrogen (—H); alkyl which has from 1 to 4 carbon atoms and is mono-substituted by alkoxycarbonyl having a total of from 2 to 5 carbon atoms, by amidocarbonyl or by substituted amidocarbonyl, the amino group of which is mono- or disubstituted by methyl or ethyl or is part of a piperidine, piperazine or morpholine nucleus; alkenyl having from 3 to 5 carbon atoms; alkynyl having from 3 to 5 carbon atoms; alkanoyl having from 1 to 4 carbon atoms; nicotinoyl; benzoyl which is mono-, di- or trisubstituted by alkoxy having 1 or 2 carbon atoms, or mono- or disubstituted by nitro or amino; amidosulfonyl; N-(mono- or di-)alkyl-substituted amidosulphonyl having a total of from 2 to 4 carbon atoms; a radical of formula III



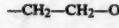
(III)

a radical of formula IV



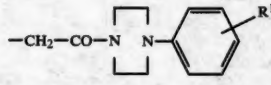
(IV)

or a radical of formula V



(V)

R^3 is hydrogen (—H), alkyl having from 1 to 4 carbon atoms, alkoxycarbonylmethyl having a total of from 3 to 6 carbon atoms, amidocarbonylmethyl, N-(mono- or di-)substituted amidocarbonylmethyl having a total of from 2 to 5 carbon atoms, or a radical of formula VII



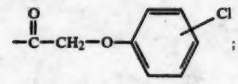
(VII)

any substituent of N-substituted amidocarbonylmethyl being one of those indicated for N-substituted amidocarbonyl; R^3 being other than hydrogen (—H) when R^2 is hydrogen or when R^1 is unsubstituted phenyl;

R^7 is $—NH_2$, piperidin-1-yl, piperazin-1-yl, 4-(lower alkyl)-piperazin-1-yl or morpholino;

R^8 is hydrogen (—H), phenyl or chloro-substituted phenyl;

R^9 is hydrogen (—H), phenoxyacetyl or a radical of formula VI



(VI)

R^{10} is hydrogen (—H) or alkoxy having 1 or 2 carbon atoms; or a physiologically-acceptable acid-addition salt thereof.

4,598,080

CERTAIN-2-METHYL-6-{4-[1-PHENYL-1-HYDROXY-PROPYL]-PHENOXYMETHYL}PYRIDINES WHICH INHIBIT MICROSONAL MONOXYGENASE SYSTEMS IN LIVER

Edit Toth; Jozsef Törley; Eva Palosi; Szabolcs Szebereneyi; László Szporny; Sandor Görög, and Istvan Hajdu, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt, Budapest, Hungary

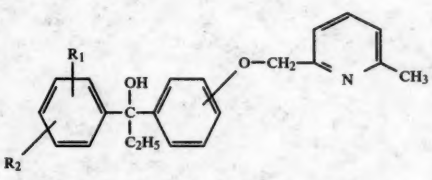
Filed Dec. 27, 1983, Ser. No. 565,831

Claims priority, application Hungary, Dec. 28, 1982, 4183

Int. Cl.[4] C07D *213/30*; A61K *31/44*

U.S. Cl. 514—277 **4 Claims**

1. A pyridine derivative



(I)

wherein

R_1 and R_2 independently represent hydrogen, halogen, trihalomethyl, alkyl having from one to 4 carbon atoms or alkoxy having from one to 4 carbon atoms,

or a pharmaceutically acceptable acid addition salt thereof.

4. A method of inhibiting the microsonal monooxygenase system in the liver of a susceptible animal subject which comprises administering to the animal subject a pharmaceutically effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable acid addition salt thereof.

4,598,081

1,3-DIOXO-1H-BENZ(DE)ISOQUINOLINE-2(3H) BUTYRIC ACID, PHARMACOLOGICALLY ACCEPTABLE SALTS THEREOF AND COMPOSITIONS CONTAINING THE SAME FOR TREATMENT OF DIABETES MELLITUS COMPLICATIONS

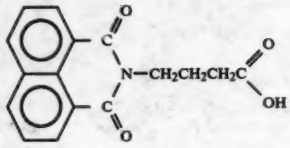
Andrei S. Efimov; Igor M. Melnik; Jury V. Tkachuk; Nikolai D. Tronko; Elena K. Efimova; Irina G. Obrosova; Vadim M. Gordienko; Leonid A. Kaminsky; Vasily I. Staninets; Jury L. Zborovsky; Nikolai A. Mokhort, and Lora M. Kirichek, all of Kiev, U.S.S.R., assignors to Nauchno-Issledovatelsky Institut Endokrinologii I Obmena Veschestv; Nauchno-Issledovatelsky Institut Farmakologii I Toksikologii and Institut Organicheckoi Khimii, all of Kiev, U.S.S.R.

Continuation of Ser. No. 660,253, Oct. 12, 1984, abandoned, which is a continuation of Ser. No. 419,447, Sep. 17, 1982, abandoned. This application Aug. 19, 1985, Ser. No. 767,054

Int. Cl.[4] C07D *221/14*; A61K *31/47*

U.S. Cl. 514—296 **10 Claims**

1. 1,3-dioxo-1H-benz(de)isoquinoline-2(3H)butyric acid having the following structural formula



and pharmacologically acceptable salts thereof.

2. A pharmaceutical composition for treating complications arising from diabetes mellitus comprising an effective amount of the compounds of claim 1 in combination with a pharmaceutical carrier.

4,598,082

ANTIMICROBIAL (N-1-OCTYL-4(1H)-PYRIDINYLIDINE)OCTANAMINE AND ACID ADDITION SALTS THEREOF AND METHODS OF USE AND COMPOSITIONS THEREOF

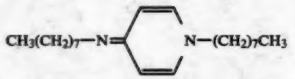
Denis M. Bailey, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Sep. 12, 1984, Ser. No. 649,587

Int. Cl.[4] C07D *213/74;* A61K *31/44*

U.S. Cl. 514—352 **8 Claims**

1. N-(1-Octyl-4(1H)-pyridinylidine)octanamine having the structural formula



or a pharmaceutically acceptable acid addition salt thereof.

5. An antimicrobial composition which comprises an antimicrobially effective concentration of N-(1-octyl-4(1H)-pyridinylidine)octanamine having the structural formula

or a pharmaceutically acceptable acid addition salt thereof and a compatible vehicle consisting of a diluent and one or more pharmaceutical adjuncts.

4,598,083

ALKYLTHIOCINNAMIC ACID NITRILES FOR THE CONTROL OF HARMFUL ORGANISMS

Carlo Skötsch; Hartmut Joppien, and Ernst A. Pieroh, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

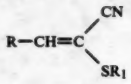
Filed Jun. 18, 1984, Ser. No. 623,133

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1983, 3322281

Int. Cl.[4] A01N *43/40, 37/34*

U.S. Cl. 514—357 **2 Claims**

1. Method for controlling insects and nematodes as well as their larvae and eggs, comprising applying onto or about the locus of said insects, nematodes, larvae or eggs an effective amount of a composition comprising at least one α-alkylthiocinnamic acid nitrile of the formula



I

wherein

R is an aromatic hydrocarbon or an aromatic hydrocarbon substituted one or more times, the same or differently, by halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio or trifluoromethyl and

R_1 is a straight-chain C_1–C_4-alkyl or cyanoethyl in admixture with a suitable carrier.

4,598,084

OPTICALLY ACTIVE DERIVATIVES OF N-ARYLATED OXAZOLIDINE-2-ONE, THE PROCESS FOR PREPARING SAME AND THEIR APPLICATION IN THERAPEUTICS

Margherita Strolin-Benedetti, Paris; Patrick G. Guerret, Rueil Malmaison; Michel Langlois, Buc, and Philippe L. Dostert, Paris, all of France, assignors to Delalande S.A., Courbevoie, France

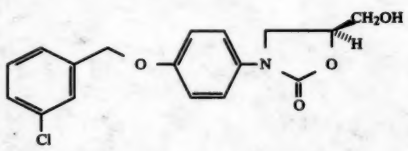
Filed Jun. 3, 1983, Ser. No. 500,682

Claims priority, application France, Jun. 8, 1982, 82 09972

Int. Cl.[4] C07D *263/24;* A61K *31/42*

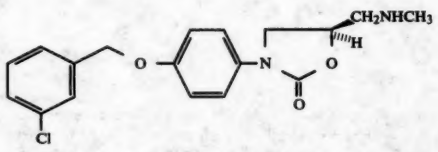
U.S. Cl. 514—374 **8 Claims**

1. A compound having the formula



and of S(+) configuration, substantially free of its enantiomer, and pharmacologically acceptable acid addition salts thereof.

5. A compound having the formula



and of R(+) configuration, substantially free of its enantiomer, and pharmacologically acceptable acid addition salts thereof.

4,598,085

FUNGICIDAL 1-(2-ARYL-2-R-ETHYL)-1H-1,2,4-TRIAZOLES

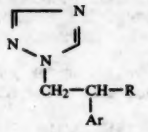
Jan Heeres, Vosselaar; Leo J. J. Backx, Arendonk, and Joseph A. Mostmans, Antwerp, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation of Ser. No. 791,632, Apr. 27, 1977, abandoned, which is a continuation-in-part of Ser. No. 713,308, Aug. 10, 1976, abandoned. This application Jan. 21, 1982, Ser. No. 341,424

Int. Cl.[4] A01N *43/653;* C07D *249/08*

U.S. Cl. 514—383 **43 Claims**

1. A chemical compound selected from the group consisting of a 1H-1,2,4-triazole derivative having the formula:



and the physiologically acceptable acid addition salts thereof, wherein:

Ar is a member selected from the group consisting of mono-, di- and tri-halophenyl and

R is a member selected from the group consisting of alkyl having from 1 to 10 carbon atoms, cycloalkyl, cycloalkyl-lower alkyl, lower alkenyl, aryl-lower alkyl, and aryloxy-lower alkyl said aryl being selected from the group consisting of phenyl, and substituted phenyl, wherein said substituted phenyl is phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, cyano, nitro and phenyl provided that when more than 1 substituents are present only 1 thereof may be selected from the group consisting of cyano, nitro and phenyl.

6. A chemical compound selected from the group consisting of 1-[4-(4-chlorophenyl)-2-(4-methylphenyl)butyl]-1H-1,2,4-triazole and the physiologically acceptable acid addition salts thereof.

14. A composition for combatting fungi, comprising an inert carrier material and as an active ingredient an effective antifungal amount of 1-[2-(2,4-dichlorophenyl)-3-methylbutyl]-1H-1,2,4-triazole and the physiologically acceptable acid addition salts thereof.

4,598,086

α_2 ANTAGONISTIC 2-(4,5-DIHYDRO-2-1H-IMIDAZOLYL)-2,3-DIHYDRO-1H-INDOLES

Dennis Bigg, 5, Parc de Diane, 78350 Jouy en Josas, and Jacques Menin, Cité Balzac D 114 - 118, rue Balzac, 94400 Vitry sur Seine, both of France

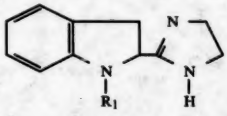
Filed Aug. 10, 1984, Ser. No. 639,323

Claims priority, application France, Aug. 11, 1983, 83 13198; Oct. 17, 1983, 83 16473; Nov. 15, 1983, 83 18121; Feb. 9, 1984, 84 01998

Int. Cl.[4] A61K *31/415;* **C07D** *403/04, 405/14*

U.S. Cl. 514—402 **2 Claims**

1. An indole derivative, in the form of the racemate or an optically active isomer, of the formula



wherein R_1 is selected from the group consisting of methyl, n-propyl, n-butyl, isobutyl, cyclopropylmethyl, allyl, phenethyl, benzyl, 4-methylbenzyl, chlorobenzyl, fluorobenzyl, and methylenedioxybenzyl or a pharmaceutically acceptable salt thereof.

2. A pharmaceutical composition for use as an α_2 antagonist which comprises, as active ingredient, an effective amount of at least one indole derivative or salt as claimed in claim 1 in association with a pharmaceutically acceptable excipient.

4,598,087

SUBSTITUTED TRANS-1,2-DIAMINOCYCLOHEXYL AMIDE COMPOUNDS

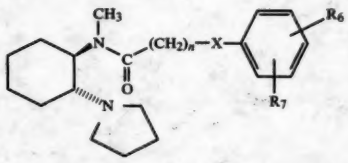
David C. Horwell, Cambridge, England, assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 558,737, Dec. 6, 1983, abandoned. This application Nov. 13, 1984, Ser. No. 669,921

Int. Cl.[4] C07D *207/06;* **A61K** *31/40*

U.S. Cl. 514—429 **6 Claims**

1. A compound having the structural formula



where n is one or two; X is —O—, —S—, or —NH—; and R_6 and R_7 are independently hydrogen, fluorine, chlorine, nitro, alkyl of from one to six carbon atoms, phenyl, or alkoxy of from one to six carbon atoms; and the pharmaceutically acceptable salts thereof.

5. A pharmaceutical composition useful for alleviating pain in a mammal, said composition comprising an analgesically effective amount of a compound in accordance with claim 1 in combination with a pharmaceutically acceptable carrier.

6. A method of alleviating pain in a mammal in need of such treatment, said method comprising administering to said mammal an analgesically effective amount of a pharmaceutical composition in accordance with claim 5 in unit dosage form.

4,598,088

2-PYRROLYL-CYCLOALKYL-AMIDE ANALGESICS

Jacob Szmuszkovicz; John M. McCall; Lester J. Kaplan, all of Kalamazoo, and Moses W. McMillan, Portage, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 495,857, May 18, 1983, abandoned. This application May 29, 1985, Ser. No. 738,637

Int. Cl.[4] A61K *31/40;* **C07D** *207/20*

U.S. Cl. 514—429 **11 Claims**

1. A compound selected from the group consisting of

3,4-dichloro-N-[2-(2,5-dihydro-1H-pyrrol-1-yl)cyclohexyl]-N-methylbenzeneacetamide,

isomeric forms of said compound, and

4-trifluoromethyl-N-[2-(2,5-dihydro-1H-pyrrol-1-yl)cyclohexyl]-N-methylbenzamide,

or a pharmaceutically acceptable salt of any of the above compounds.

9. A method for alleviating pain which comprises administering to an animal suffering pain an analgesically effective amount of a compound of claim 1 in a pharmaceutical dosage unit form.

4,598,089

LEUCINE DERIVATIVES

Paul Hadvary, Biel-Benken; Erich Hochuli, Arisdorf; Ernst Kupfer, Basel; Hans Lengsfeld, Reinach, and Ernst K. Weibel, Pratteln, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

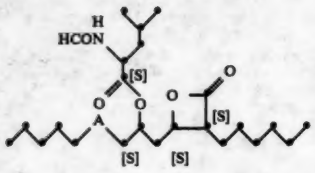
Filed Jun. 18, 1984, Ser. No. 621,827

Claims priority, application Switzerland, Jun. 22, 1983, 3415/83

Int. Cl.[4] C07D *305/12;* **C12P** *17/02;* **A61K** *31/365*

U.S. Cl. 514—449 **20 Claims**

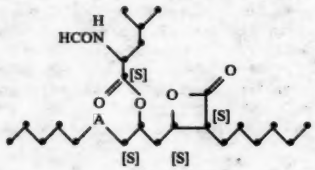
1. A compound of the formula



wherein A is the group

or $-(CH_2)_5-$.

9. A method of treating obesity in an afflicted mammal comprising administering to the mammal a compound of the formula

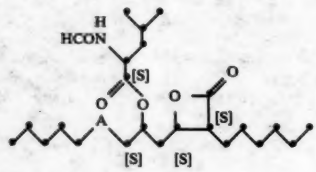


wherein A is the group

or $-(CH_2)_5-$

in an amount which is effective in treating obesity.

17. A method of preventing obesity in a mammal comprising administering to the mammal a compound of the formula



wherein A is the group

or $-(CH_2)_5-$,

in an amount which is effective in preventing obesity by inhibiting pancrease lipase.

4,598,090

CONDENSED BENZOPYRONE DERIVATIVES

Gianfederico Doria, Milan; Carlo Passarotti, Gallarate, and Ada Buttinoni, Milan, all of Italy, assignors to Farmitalia Carlo Erba, S.p.A., Milan, Italy

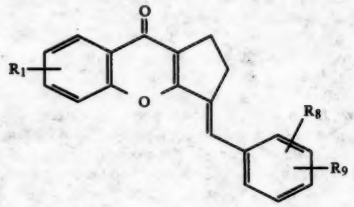
Filed Mar. 22, 1984, Ser. No. 592,472

Claims priority, application United Kingdom, Apr. 6, 1983, 8309260

Int. Cl.[4] A61K *31/35*; C07D *311/82*

U.S. Cl. 514—455 5 Claims

1. A compound of formula (I)

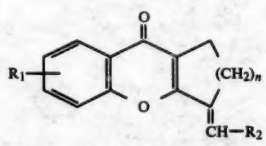


wherein

R_1 is amino, hydroxy, carboxy, C_1–C_4 alkoxycarbonyl unsubstituted or substituted by di(C_1–C_4)alkylamino, —NHCOCOOR, —NHCOCH=CH—COOR, wherein R is hydrogen or C_1–C_4 alkyl, $-NHCO(CH_2)_p-COOR$ or $-O-(CH_2)_p-COOR$, wherein p is 1, 2 or 3 and R is as defined above;

each of R_8 and R_9 independently is hydrogen, halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, di(C_1–C_4) alkylamino or R_8 and R_9, being adjacent, taken together form a methylenedioxy group; or a pharmaceutically acceptable salt thereof.

5. A method of producing an anti-allergic effect in a patient in need of such affect, said method comprising administering to said patient an anti-allergic effective amount of a compound of the formula:



(I)

wherein

n is 1 or 2;

R_1 is

(a) hydrogen, halogen or C_1–C_6 alkyl;

(b) cyano, aminocarbonyl, carboxy or a C_1–C_6 alkoxycarbonyl group unsubstituted or substituted by a di(C_1–C_6-)alkylamino group;

(c) nitro, amino;

(d) a

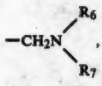
group, wherein R_3 is hydrogen or C_1–C_6 alkyl and R_4 is:

(a') formyl, C_2–C_6 alkanoyl or C_1–C_6 alkyl, wherein the alkyl is unsubstituted or substituted by one or two substituents chosen from hydroxy and phenyl;

(b') a $-(CO)_m-A-R_5$ group, wherein m is zero or 1; A completes a single bond, or is a phenylene moiety, or it is a branched or straight C_1–C_6 alkylene or C_2–C_6 alkenylene chain and R_5 is:

(a'') carboxy or C_1–C_6 alkoxycarbonyl, unsubstituted or substituted by a di-(C_1–C_6)alkyl-amino group; or

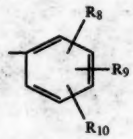
(b'') halomethyl or



wherein each of R_6 and R_7 is independently hydrogen or C_1–C_6 alkyl

(c) hydroxy or a —OR_4 group, wherein R_4 is as defined above;

R_2 is a group of the formula



wherein each of R_8, R_9 and R_{10} is independently hydrogen; halogen; C_1–C_6 alkyl; hydroxy; C_1–C_6 alkoxy; C_3–C_4 alkenyloxy; formyloxy; C_2–C_6 alkanoyloxy; carboxy; C_1–C_6 alkoxycarbonyl; nitro; or a group

wherein each of R_{11} and R_{12} independently represents hydrogen, C_1–C_6 alkyl, formyl or C_2–C_6 alkanoyl; or any two adjacent R_8, R_9 and R_{10} groups, taken together, form a C_1–C_3 alkylenedioxy group, or a pharmaceutically acceptable salt thereof, and wherein, when n is 1 and, at the same time, R_2 is unsubstituted phenyl, R_1 is other then hydrogen.

4,598,091

(1,2-DIPHENYL)-ETHYLENEDIAMINE)-PLATINUM (II) COMPLEX COMPOUNDS

Helmut Schonenberger, Pentling; Beate Wappes, Regensburg; Margaretha Jennerwein, Regensburg; Erwin von Angerer, Regensburg, and Jurgen Engel, Alzenau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

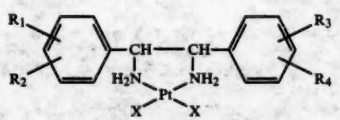
Filed Feb. 15, 1984, Ser. No. 580,238

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1983, 3305636

Int. Cl.[4] A01N *55/02;* **A61K** *31/32;* **C07F** *15/00*

U.S. Cl. 514—492 **14 Claims**

1. A (1,2-diphenyl-ethylenediamine)-platinum (II) complex compound of the formula



I

where the groups R_1, R_2, R_3 and R_4 are hydrogen, hydroxy, C_1–C_6-alkoxy, C_2–C_6-alkanoyloxy, C_2-alkanoyloxy substituted by at least one halogen atom or a C_1–C_4-alkanesulfonyloxy group, or C_3–C_6-alkenoyloxy, with the proviso that at least one of R_1, R_2, R_3 and R_4 is not hydrogen and X is the equivalent of a pharmaceutically compatible anion.

10. A compound according to claim 1 wherein X is chloro, sulfato, or cyclobutanedicarboxylic acid.

4,598,092

α-HYDROXY-β-HALOETHYLPHOSPHINIC ACIDS AND THEIR SALTS, AND THEIR PRODUCTION AND USE

Mitsuru Sasaki, and Yukio Oguri, both of Toyonaka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

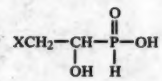
Filed Nov. 18, 1983, Ser. No. 553,049

Claims priority, application Japan, Dec. 1, 1982, 57-211815

Int. Cl.[4] C07F *5/06;* **A01N** *55/02;* **A61K** *31/28*

U.S. Cl. 514—492 **19 Claims**

1. A compound of the formula:



wherein X is a chlorine atom or a bromine atom, or an organic or an inorganic base or metal salt thereof.

4,598,093

4-AMINO-TETRAHYDRO-2-NAPHTHOIC ACID DERIVATIVES

Tetsuya Tahara, Oita; Masafumi Arita, Tokyo, and Tsuyoshi Kuroda, Oita, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

PCT No. PCT/JP83/00285, § 371 Date May 7, 1984, § 102(e) Date May 7, 1984, PCT Pub. No. WO84/00957, PCT Pub. Date Mar. 15, 1984

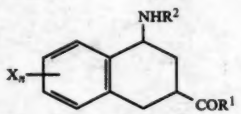
PCT Filed Aug. 30, 1983, Ser. No. 609,083

Claims priority, application Japan, Sep. 7, 1982, 57-155584; Sep. 7, 1982, 57-155585

Int. Cl.[4] A61K *31/215, 31/195, 31/165;* **C07C** *103/22*

U.S. Cl. 514—538 **9 Claims**

1. 4-Amino-1,2,3,4-tetrahydro-2-naphthoic acid derivatives of the formula:



or salts thereof, wherein X is halogen atom, n is 1 or 2, R^1 is hydroxy group, C_1 to C_4 alkoxy group or amino group, and R^2 is hydrogen atom.

9. A pharmaceutical composition comprising a therapeutically effective amount of said compound as claimed in claim 1 and a pharmaceutically acceptable carrier.

4,598,094

METHOD AND COMPOSITION FOR ENHANCING THE EFFECT OF INDIRECT-ACTING SYMPATHOMIMETIC AMINES

Richard J. Wurtman, Boston, and Timothy J. Maher, Milton, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Sep. 25, 1985, Ser. No. 780,054

Int. Cl.[4] A61K *31/195*

U.S. Cl. 514—561 **2 Claims**

1. The process for preventing tachyphylaxis of amphetamine administered to a patient which comprises administering to said patient concomitantly with said amphetamine a catecholamine precursor selected from the group consisting of tyrosine,

a tyrosine precursor or a mixture of tyrosine and a tyrosine precursor to obtain a tyrosine blood plasma concentration between about 15 and 100 μg/ml.

4,598,095

ANTIVIRAL ISOTHIOSEMICARBAZONES

Tamio Nishimura, No. 5-4-11, Masukata, Tama-ku, Kawasaki-shi, Kanagawa; Hiroshige Toku, No. 16-5, Narusedai 3-chome, Machida-shi, Tokyo; Shin Yoshii, No. 14-27, Moegino, Midori-ku, Yokohama-shi, Kanagawa; Harumi Fukuyasu, No. 4-1-104, Maborikaigan, Yokusuka-shi, Kanagawa; Kuniomi Matsumoto, No. 2712-80, Naruse, Machida-shi, Tokyo; Youzo Kazuno, No. 1312-135, Uchikoshi-cho, Hachioji-shi, Tokyo, and Tetsuro Watanabe, No. 390-3, Matsumi-cho 2-chome, Kanagawa-ku, Yokohama-shi, Kanagawa, all of Japan

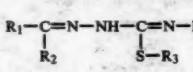
Filed Mar. 4, 1983, Ser. No. 472,407

Claims priority, application Japan, Mar. 5, 1982, 57-34062

Int. Cl.[4] A61K *31/155*; A01N *37/52*

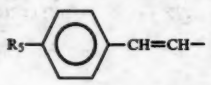
U.S. Cl. 514—632 5 Claims

1. A process for treating a subject having an A_2-type influenza virus infection which comprises administering orally or by injection an anti A_2-type influenza viral effective amount of an isothiosemicarbazone represented by the following general formula (I) or an acidic salt thereof:



(I)

wherein R_1 represents an unsubstituted phenyl group or a phenyl group substituted by at least one of 1 to 3 halogen atoms selected from the group consisting of fluorine, chlorine and bromine, a methyl group substituted in the para position of the phenyl group, a hydroxyl group, or an alkoxy group containing 1 to 12 carbon atoms substituted in the para position of the phenyl group, or an unsubstituted or substituted phenylethynyl group represented by the following general formula (II)



(II)

wherein R_5 represents a chlorine atom, or an alkoxy group containing 1 to 12 carbon atoms; R_2 represents a hydrogen atom or a C_1–C_6 alkyl group; and R_3 represents a C_1–C_6 alkyl group; and R_4 represents a hydrogen atom or a methyl group, to said subject.

4,598,096

SAFE SENSORY IRRITANT

George A. Grant, 46 Crystal Beach, Nepean, Ontario K2H5M9, Canada

Filed Nov. 6, 1981, Ser. No. 318,817

Int. Cl.[4] A61K *31/075*

U.S. Cl. 514—715 9 Claims

1. A method of safely forcing the egress of human beings from a zone by supplying the zone with an irritating amount of 1-methoxy-1,3,5-cycloheptatriene.

4,598,097

PIG FEEDSTUFF

Frederick G. Perry, Sudbury, and John Fisher, Northwich, both of England, assignors to BP Nutrition (UK) Limited, Essex, England

Filed Jun. 20, 1984, Ser. No. 622,590

Claims priority, application United Kingdom, Jul. 1, 1983, 8317909

Int. Cl.[4] A61K *31/23*

U.S. Cl. 514—738 1 Claim

1. A method of feeding male pigs to increase their growth rate consisting essentially of including in a nutritionally balanced pig feed from 0.01 to 1% wt sorbitol by weight of total feed wherein the feed also contains from about 2.5% to 20% lipid by weight of the total feed.

4,598,098

POLYMER FOAM, THERMOFORMED SHAPES THEREOF AND METHODS OF FORMING SAME

Charles M. Krutchen, Pittsford, and Wen-Pao Wu, Victor, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 560,641, Dec. 12, 1983, Pat. No. 4,535,100.

This application Jul. 19, 1985, Ser. No. 756,898

Int. Cl.[4] C08J *9/00*

U.S. Cl. 521—59 5 Claims

1. A composition comprising discrete particles of a blend of polyphenylene oxide and a high impact polystyrene imbibed with a solvent member selected from the group consisting of methylene chloride, chloroform, 1,1,2-trichloroethane and mixtures thereof, said solvent being present in a quantity sufficient to foam said resin to a density less than about 20 lbs./ft^3.

4,598,099

PROCESS FOR THE PRODUCTION OF POLYBENZIMIDAZOLE FOAMS

Norman S. Trouw, Gillette, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Oct. 24, 1985, Ser. No. 791,049

Int. Cl.[4] C08J *9/02*

U.S. Cl. 521—77 40 Claims

1. A process for the preparation of a polybenzimidazole foam wherein the process comprises the following steps:

(a) preparing a casting solution of a polybenzimidazole polymer in a solvent capable of dissolving the polymer;

(b) acidifying the polybenzimidazole polymer solution using sulfuric acid;

(c) forming a shaped article from the casting solution;

(d) removing the solvent from the shaped article; and

(e) heat treating the shaped article to form a foam.

4,598,100

POLYMER FOAM, THERMOFORMED SHAPES THEREOF AND METHODS OF FORMING SAME

Charles M. Krutchen, Pittsford, and Wen-Pao Wu, Victor, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 560,641, Dec. 12, 1983, Pat. No. 4,535,100.

This application Jul. 19, 1985, Ser. No. 756,896

Int. Cl.[4] C08J *9/00, 9/14*

U.S. Cl. 521—81 6 Claims

1. The process of preparing a low density polymer foam structure, said polymer being a solvent imbibable blend of polyphenylene oxide and a high impact polystyrene comprising:

(a) providing said polymer blend in particle form imbibed with a solvent member selected from the group consisting of methylene chloride, chloroform, 1,1,2-trichloroethane and mixtures thereof;

(b) homogeneously melt blending said particles and solvent in an extrusion system under pressure; and

(c) extruding said melt blend into a lower pressure atmosphere to cause said solvent to vaporize yielding a foam structure said foam structure having a density of less than about 20 lbs./ft^3.

4,598,101

POLYMER FOAM, THERMOFORMED SHAPES THEREOF AND METHODS OF FORMING SAME

Charles M. Krutchen, Pittsford, and Wen-Pao Wu, Victor, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 560,641, Dec. 12, 1983. This application Jul. 29, 1985, Ser. No. 759,776

Int. Cl.[4] C08J 9/14

U.S. Cl. 521—81 2 Claims

1. The process of preparing a low density resin blend foam structure comprising:

(a) providing a blend of polyphenylene oxide and a high impact polystyrene in an extrusion system under pressure and melting the same;

(b) homogeneously mixing the molten polymer blend with a blowing agent member selected from the group consisting of methylene chloride, chloroform, 1,1,2-trichloroethane and mixtures thereof, said blowing agent being present in a proportion sufficient to foam the polymer blend to a density less than about 20 lbs./ft^3; and

(c) extruding the melt blend into a lower pressure atmosphere to cause the blowing agent to vaporize yielding a polyphenylene oxide/high impact polystyrene blend foam structure.

4,598,102

METHOD, COMPOSITION AND PRODUCT PRODUCED BY DELAYED GELATION IN THE POLYMERIZATION OF CYCLOOLEFINS

Douglas R. Leach, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 623,307, Jun. 21, 1984, Pat. No. 4,496,669, which is a continuation of Ser. No. 552,872, Nov. 17, 1983, Pat. No. 4,458,037. This application Nov. 16, 1984, Ser. No. 672,390

The portion of the term of this patent subsequent to Jan. 29, 2002, has been disclaimed.

Int. Cl.[4] C08G 18/14

U.S. Cl. 521—93 53 Claims

1. A low solvent feed composition for polymerization of cyclic olefin having less than one percent of noncycloolefin solvent on a molar basis, comprising:

(a) at least one cyclic olefin; and

(b) an activator mixture comprising a dialkylaluminum iodide.

4,598,103

CATALYST SYSTEMS FOR POLYURETHANE COMPOSITIONS

Eugene Y. C. Chang, Bridgewater, N.J., assignor to Americen Cyanamid Company, Stamford, Conn.

Division of Ser. No. 588,015, Mar. 9, 1984, Pat. No. 4,547,478. This application Jul. 22, 1985, Ser. No. 757,710

Int. Cl.[4] C08G 18/14

U.S. Cl. 521—126 12 Claims

1. A curable composition comprising:

(a) an aliphatic hydroxyl containing compound;

(b) a compound having hindered aliphatic secondary or tertiary isocyanate groups; and

(c) a catalytically effective amount of a catalyst composition comprising

(i) 1,8-diazabicyclo(5.4.0)-undecene-7 or a salt thereof;

(ii) an organic tin compound; and, optionally,

(iii) an organic lead compound, the weight ratios of (i):(ii):-(iii) being in the range, respectively, of from about 0.5:1:0 to about 2:1:3.

4,598,104

POLYMER FOAM, THERMOFORMED SHAPES THEREOF AND METHOD OF FORMING SAME

Charles M. Krutchen, Pittsford, and Wen-Pao Wu, Victor, both of N.Y., assignors to Mobil Oil Company, New York, N.Y.

Division of Ser. No. 560,641, Dec. 12, 1983, Pat. No. 4,535,100. This application Jul. 19, 1985, Ser. No. 756,900

Int. Cl.[4] C08J 9/14

U.S. Cl. 521—139 5 Claims

1. A polymer blend in foam form having a density of less than about 20 lbs./ft^3, whereby said polymer is a solvent imbibable blend of polyphenylene oxide and a high impact polystyrene, wherein said solvent is a member selected from the group consisting of methylene chloride, chloroform, 1,1,2-trichloroethane and mixtures thereof.

4,598,105

RUBBER COMPOSITION AND METHOD

Kenneth E. Weber, Pacific Palisades, Calif., and Dirk Oberlin, Autora, Colo., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 534,347, Sep. 21, 1983, abandoned, which is a continuation of Ser. No. 398,995, Jul. 16, 1982, abandoned. This application Sep. 17, 1984, Ser. No. 651,615

Int. Cl.[4] C08K 3/04, 3/28, 5/17, 9/04

U.S. Cl. 523—215 37 Claims

1. A method of compounding rubber comprising mechanically mixing and substantially uniformly dispersing the following materials in natural rubber, polyisoprene rubber, styrene-butadiene rubber, or polybutadiene rubber:

A. 1. particulate agent G selected from the group consisting of kaolin, metakaolin, talc, pyrophyllite, metal carbonate, coal, and coke and having a median particle size in the range of from about 0.01 to about 20 microns,

A. 2. particulate carbon black having a median particle size in the range of from about 0.001 to about 20 microns, and

A. 3. a coupling agent consisting essentially of quaternary ammonium salt at a level of from about 0.005 to about 15 phr; or

B. 1. a particulate adduct of Agent G and a coupling agent consisting essentially of the quaternary ammonium salt, having a median particle size in the range of from about 0.01 to about 20 microns and present at a level such that the portion thereof contributed from the quaternary ammonium salt is at a level of from about 0.005 to about 15 phr, and

B. 2. the particulate carbon black; or

C. 1. a particulate adduct of the particulate carbon black and a coupling agent consisting essentially of the quaternary ammonium salt, having a median particle size in the range of from about 0.001 to about 20 microns and present at a level such that the portion thereof contributed from the quaternary ammonium salt is at a level of from about 0.005 to about 15 phr, and

C. 2. particulate Agent G; or

D. 1. a particulate adduct of Agent G and a coupling agent consisting essentially of the quaternary ammonium salt having a median particle size in the range of from about 0.01 to about 20 microns and present at level such that the portion thereof contributed from the quaternary ammonium salt is at a level of from about 0.005 to about 15 phr, and

D. 2. a particulate adduct of the carbon black and a coupling agent consisting essentially of the quaternary ammonium salt having a median particle size in the range of from about 0.001 to about 20 microns and present at a level such that the portion thereof contributed from the quaternary ammonium salt is at a level of from about 0.005 to about 15 phr;

wherein the combined contents of (1) Agent G or the portion of the aforesaid adduct contributed from Agent G and (2) the carbon black or the portion of the aforesaid adduct contributed from the carbon black are in the range of from about 5 to about

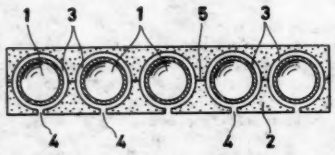
400 phr and the weight ratio of (1) Agent G or the portion of the aforesaid adduct contributed from Agent G -to- (2) the carbon black or the portion of the aforesaid adduct contributed from the carbon black is in the range of from about 1:19 to about 9:1.

4,598,106

PRESSURE-RESISTANT BUOYANCY MATERIAL

Katsumi Utsugi, Hidakamachi, Japan, assignor to Nippon Oils & Fats Co., Ltd., Tokyo and Nichiyu Giken Kogyo Co., Ltd., Kawagoe, both of, Japan

Filed Mar. 21, 1985, Ser. No. 714,391
Claims priority, application Japan, Nov. 9, 1984, 59-235032
Int. Cl.[4] C08J 9/32
U.S. Cl. 523—218 5 Claims



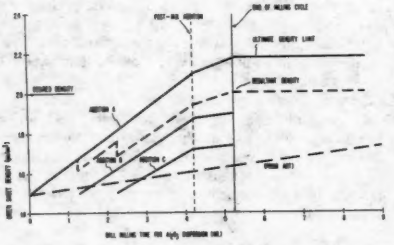
1. A pressure-resistant buoyancy material, which comprises two identical molded pieces of unsaturated polyester resin or epoxy resin syntactic foam containing uniform hemispheric depressions, said pieces having been joined to each other so that each hemisphere forms a spherically shaped cavity therein, where each cavity contains therein a hollow pressure-resistant sphere which is smaller in diameter than said cavity so that said sphere is freely movable in said cavity, and further wherein each cavity communicates with the outside of said molded pieces by way of an empty path through said syntactic foam.

4,598,107

STEPWISE/ULTIMATE DENSITY MILLING

Lester W. Herron, and Robert W. Nufer, both of Hopewell Junction, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 624,084, Jun. 25, 1984, abandoned. This application Aug. 7, 1985, Ser. No. 763,157
Int. Cl.[4] C08K 5/09; C08L 1/08; C04B 33/34
U.S. Cl. 523—351 10 Claims



1. A method of forming a slurry for casting into a ceramic sheet from predetermined quantities of an organic solvent, a solvent soluble polymeric binder material, a resin plasticizer and a ceramic particulate consisting in separated parts of aluminum oxide and glass frit, said method comprising;

(a) forming a relatively low viscosity pre-mix having a viscosity in the range 2–8 cps by combining a predetermined portion of the solvent, all of the plasticizer and a predetermined portion of said binder material;

(b) forming a relatively high viscosity post-mix having a viscosity in the range 3,000–30,000 cps by combining the remaining portions of said solvent and said binder material;

(c) mixing the glass frit in said pre-mix;

(d) dispersing the aluminum oxide in the glass frit and pre-mix mixture and forming an intermediate slurry by adding the aluminum oxide, stepwise, in predetermined portions and mixing for predetermined periods of time; and

(e) combining said post-mix with said intermediate slurry.

4,598,108

WATER REDUCIBLE COMPOSITION BASED ON AN EPOXY RESIN

Cornelis A. M. Hoefs, Elst, Netherlands, assignor to Akzo NV, Arnhem, Netherlands

Filed Jun. 27, 1985, Ser. No. 749,398
Claims priority, application Netherlands, Jul. 6, 1984, 8402166
Int. Cl.[4] C08L 63/00; C08K 5/41, 5/32
U.S. Cl. 523—411 7 Claims

1. A water-reducible coating composition comprising an epoxy resin, an amino group-containing curing agent for it and an emulsifying auxiliary compound, characterized in that the emulsifying auxiliary compound is a water soluble organic compound which occurs in at least 2 tautomeric forms, in one of which a labile hydrogen atom is linked to a carbon atom and which compound contains at least one carbonyloxy group or sulfonyl group.

4,598,109

PRODUCTION OF EPOXY PHOSPHATES

Kazys Sekmakas, Palatine, and Raj Shah, Schaumburg, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Oct. 18, 1984, Ser. No. 662,162
The portion of the term of this patent subsequent to Jan. 10, 2001, has been disclaimed.
Int. Cl.[4] C08G 59/14
U.S. Cl. 523—414 18 Claims

1. A process of producing a water dispersible epoxy phosphate-solvent mixture comprising heating said solvent with orthophosphoric acid to reaction temperature together with an amount of water such that the total amount of water is sufficient to hydrolyze at least about 50% of the oxirane functionality in the polyepoxide which is used, slowly adding a resinous polyepoxide to said heated mixture so that reaction with phosphoric acid and hydrolysis of the oxirane will occur simultaneously to minimize the concentration of oxirane functionality in the reaction mixture as the reaction proceeds, thus minimizing epoxy-epoxy reactions which increase the molecular weight of the epoxy phosphate which is formed, and then adding volatile amine to destroy any remaining oxirane functionality and to partially or fully neutralize the epoxy phosphate to provide a water dispersible epoxy phosphate-solvent mixture.

4,598,110

RESIN COMPOSITION CONTAINING GRANULAR OR POWDERY PHENOL-ALDEHYDE RESIN

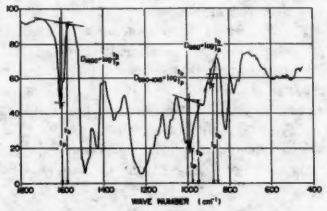
Hiroaki Koyama, and Shigeo Shimizu, both of Kobe, Japan, assignors to Kanebo Ltd., Tokyo, Japan

Continuation of Ser. No. 452,737, Dec. 23, 1982, Pat. No. 4,476,277. This application Jun. 12, 1984, Ser. No. 619,950
Claims priority, application Japan, Dec. 26, 1981, 56-209558; Dec. 28, 1981, 56-209850; Feb. 18, 1982, 57-23530; Mar. 4, 1982, 57-33099; Mar. 4, 1982, 57-33100; Mar. 5, 1982, 57-34036
Int. Cl.[4] C08L 63/00
U.S. Cl. 523—446 19 Claims

1. A resin composition comprising:

(I) A granular or powdery resin which is a condensation product of a phenol and an aldehyde, and has a D_{990}–1015/D1600 ratio of from 0.2 to 9.0 and D_{890}/D_{1600}

ratio of from 0.09 to 1.0 in its infrared absorption spectrum measured by a KBr tablet method, in which D_{1600} represents the absorption intensity of an absorption peak at 1600 cm^{-1}, $D_{990-1015}$ represents the highest absorption intensity of absorption peaks in the range of 990 to 1015 cm^{-1}, and D_{890} represents the absorption intensity of an absorption peak at 890 cm^{-1}, and is further characterized (A) in that at least 30% of the granular or powdery resin consists of spherical primary particles and their secondary ag-



glomerated particles, each having a particle diameter of 0.1 to 150 microns, (B) by having such a size that at least 50% of weight thereof can pass through a 100 Tyler mesh sieve, and (C) by having a free phenol content, determined by liquid chromatography, of not more than 500 ppm, and (II) at least one curable resin selected from the group consisting of resol resins, novolak resins, epoxy resins, furan resins, melamine resins, urea resins and unsaturated polyester resins.

4,598,111

COATING COMPOSITION CONTAINING CROSS-LINKED MICROPARTICLES

Howard J. Wright, Kansas City, Mo.; David P. Leonard, Overland Park, Kans., and Roger A. Etzell, Farmington Hills, Mich., assignors to Glasurit America, Inc., Detroit, Mich.

Continuation of Ser. No. 359,307, Mar. 18, 1982, abandoned, which is a continuation-in-part of Ser. No. 256,959, Apr. 23, 1981, Pat. No. 4,377,661, and Ser. No. 297,631, Aug. 31, 1981, Pat. No. 4,414,357, each is a division of Ser. No. 98,115, Nov. 27, 1979, Pat. No. 4,290,932. This application Sep. 4, 1984, Ser. No. 646,495

The portion of the term of this patent subsequent to Sep. 22, 1998, has been disclaimed.

Int. Cl.[4] C08L *33/02, 33/14, 33/04*

U.S. Cl. 524—40 **17 Claims**

1. A coating composition for the preparation of coatings on substrates, consisting essentially of:

(a) 10 to 60% by weight of a film-forming synthetic resin selected from the group consisting of acrylic polymers, vinyl ester copolymers, alkyd resins, polyester resins, nitrogen containing condensation resins, mixtures thereof, and mixtures thereof with cellulose esters;

(b) 40 to 80% by weight of an organic solvent in which said synthetic resin is soluble;

(c) 2.5 to 25% by weight of polymer microparticles having ionic or a mixture of polar and ionic groups on their surfaces and having a diameter of 0.01 to 5 microns prepared by emulsion-polymerizing ethylene-unsaturated monomers in an aqueous phase, at least one of said monomers selected from the group consisting of acrylic acid, methacrylic acid, and —OH substituted alkyl esters thereof and containing polar functional groups selected from hydroxy groups, tertiary amine, sulfonic acid, and carboxylic acid groups, and at least another of said monomers selected from the group consisting of an alkyl ester of acrylic acid, an alkyl ester of methacrylic acid, styrene and methyl styrene, said another of said monomers being free from said polar functional groups and a multifunctional cross-linking agent present in an amount greater than about 10% to 70% by weight of the total weight of said ethlenically unsaturated monomers and cross-linking agent, said cross-linking agent cross-linking said microparticles to a degree that said polar and said ionic groups are fixed on the surface of said microparticles, and subsequently removing water from said aqueous phase, said microparticles being insoluble in the solution of said synthetic resin in said organic solvent and having said polar and ionic groups fixed on the surfaces, rearrangement of said polar and ionic groups into the particle interior being prevented by the cross-linking from said cross-linking agent; and

(d) 2 to 40% by weight of pigments.

4,598,112

LOW TACK CATIONIC MICROSPHERE GLUE

Philip H. Howard, Jamesville, N.Y., assignor to International Cube Corp., Syracuse, N.Y.

Filed Sep. 14, 1984, Ser. No. 650,448

Int. Cl.[4] C08K *11/00*

U.S. Cl. 524—78 **1 Claim**

1. A low tack microsphere containing glue suspension for application to a substrate to provide a reusable adhesive surface, wherein the microspheres are surrounded by a cationic surfactant which prevents particle coalescence, prepared according to the process comprising the steps of:

admixing, in approximate parts by weight, 2820 parts water; 54 parts of a 15% aqueous solution of polyacrylic acid having a molecular weight of 300,000 to 500,000 until said acid is dissolved, to form a solution;

raising the pH of said solution to 7.0 by adding concentrated ammonium hydroxide thereto;

adding 3.5 parts of a 70% active benzoyl peroxide catalyst, 1000 parts 2-ethylhexyl acrylate and 30 parts of an ethoxylated tallow amine to said solution to form a mixture;

holding said mixture under a vacuum of about 25 inches of mercury with stirring for about 15 minutes;

heating said mixture to about 60° C. for about 16 hours to form an aqueous suspension; and

passin said suspension through a 250 micron screen to remove a small amount of unsuitable larger particle agglomerates.

4,598,113

HINDERED HYDROXYPHENYLALKANOATES OF ETHOXYLATED BISPHENOL A AND STABILIZED COMPOSITIONS

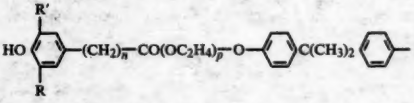
John F. Stephen, West Chester, Pa.; Jerry H. Smith, and Makram H. Meshreki, both of Wilmington, Del., assignors to ICI Americas Inc., Wilmington, Del.

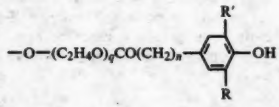
Filed Aug. 15, 1985, Ser. No. 765,641

Int. Cl.[4] C07C *69/76, 69/78;* **C08K** *5/13*

U.S. Cl. 524—291 **7 Claims**

1. A hindered hydroxyphenylalkanoate of ethoxylated bisphenol A having the formula:





wherein:

R and R' are independently hydrogen or alkyl groups of from 1 to 4 atoms,

p and q are 1 or 2,

p+q has a value of 2 to 3, and
n has a value of 1 to 6.

5. A composition comprising a polymerized ethylenically unsaturated monomer and 0.005–5% by weight of a compound of claim 1.

4,598,114

ESSENTIALLY NEUTRAL RUST CONVERTER AND RUST PREVENTIVE

Ulrich Berens, Verl, Fed. Rep. of Germany, assignor to Ingenieurburo Leuenberger AG, Huttwil, Switzerland

Continuation-in-part of Ser. No. 652,344, Sep. 19, 1984, abandoned. This application Jun. 27, 1985, Ser. No. 749,937
Claims priority, application Switzerland, Jun. 29, 1984, 3161/84
Int. Cl.[4] C08K 5/05; C09D 5/08, 3/58, 3/64
U.S. Cl. 524—345 18 Claims

1. A rust converter and rust preventive which contains
(a) an aqueous dispersion, emulsion or solution of at least one polymeric binder and
(b) at least one trihydroxybenzene, and which
(c) has an essentially neutral reaction.

4,598,115

POLYAMINO-BIS-MALEIMIDE PREPOLYMER, METHOD FOR MANUFACTURE THEREOF, AND METHOD FOR MANUFACTURE OF LAMINATE USING SAID PREPOLYMER

Atsushi Fujioka; Yasuo Miyadera, and Tomio Fukuda, all of Shimodate, Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Sep. 13, 1984, Ser. No. 650,905
Claims priority, application Japan, Sep. 14, 1983, 58-170240; Sep. 29, 1983, 58-181575
Int. Cl.[4] C08K 5/06
U.S. Cl. 524—376 9 Claims

1. A polyamino-bis-maleimide prepolymer solution obtained by the reaction at a reactive temperature of 1 mol of N,N'-4,4'-diphenylmethane-bis-maleimide with 0.25 to 0.4 mol of 4,4'-diaminodiphenylmethane in an alkyleneglycol monoalkyl ether as a solvent until the stated prepolymer solution is obtained.

4,598,116

SCORCH RESISTANT COMPOSITIONS BASED ON WATER-CURABLE THERMOPLASTIC POLYMERS HAVING HYDROLYZABLE, PENDANT SILANE MOIETIES, AND ORGANO TITANATES

Michael J. Keogh, Bridgewater, and Gary H. Williams, Somerville, both of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Nov. 9, 1984, Ser. No. 669,753
Int. Cl.[4] C08K 5/04
U.S. Cl. 524—398 34 Claims

1. A composition consisting essentially of a preformed water-curable thermoplastic polymer having hydrolyzable, pendant silane moieties, prepared in the presence of a free radical generating compound; and an organo titanate having the formula:

$$Ti(OR^2)_4$$

wherein each R^2 is a monovalent hydrocarbon radical having 1 to 3 carbon atoms inclusive, said organo titanate being present in at least about 0.05 percent by weight.

4,598,117

ELASTOMERIC COMPOSITIONS COMPRISING A COMBINATION OF (A) AN AROMATIC THERMOPLASTIC POLYESTER AND (B) CLAY/SYENITE

Nan-I Liu, and Russell J. McCready, both of Mt. Vernon, Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Jan. 11, 1985, Ser. No. 691,027
Int. Cl.[4] C08K 3/34; C08L 77/00; C08G 63/68, 73/16
U.S. Cl. 524—444 33 Claims

1. A thermoplastic molding composition comprising:
(a) one or more thermoplastic elastomeric polymers characterized as having ether, ester and imide linkages and wherein the ether linkages are present as high molecular weight, i.e. MW of from about 400 to about 12000, polyoxyalkylene or copolyoxyalkylene units derived from long chain ether glycols or long chain ether diamines, and
(b) a modifying amount of a combination of
(i) an aromatic thermoplastic polyester and
(ii) a mineral filler selected from the group consisting of clay and syenite.

4,598,118

COATINGS CONTAINING AN ALPHAOLEFIN TERPOLYMER

Frederick C. Hansen, Union Grove, and Richard A. Kiehlbauch, Racine, both of Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Jun. 28, 1983, Ser. No. 508,698
The portion of the term of this patent subsequent to Jun. 11, 2002, has been disclaimed.
Int. Cl.[4] C08L 37/00
U.S. Cl. 524—517 6 Claims

1. A coating composition comprising:
(a) from 0.5 to 30% by weight of a terpolymer which comprises:
(i) from about 49 to 60 mole percent of maleic anhydride;
(ii) from about 20 to 40 mole percent of at least one monomer selected from the group consisting of a 1-alkene having from 4 to 16 carbon atoms, a monoalkenyl aromatic compound selected from styrene, alphamethyl styrene, vinyl toluene and mixtures thereof; and
(iii) from about 20 to 40 mole percent of at least one 1-alkene having at least 18 carbon atoms;
(b) from about 1 to 55 percent by weight of an acrylic emulsion polymer having a weight average molecular weight of greater than 20,000; and
(c) the balance being an aqueous vehicle.

4,598,119

STABILIZED WATER-IN-OIL EMULSIONS OF A POLYACRYLATE

Henry Volk, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 80,808, Oct. 1, 1979, abandoned. This application Feb. 15, 1983, Ser. No. 466,767
Int. Cl.[4] C08K 3/30
U.S. Cl. 524—215 2 Claims

1. A water-in-oil emulsion of stabilized water-soluble acrylate polymer consists of polymerized acrylic acid and/or methacrylic acid and an amount of a stabilizer selected from the group consisting of a water-soluble thiosulfate, thiocyanate, nitrite and thiourea sufficient to improve the viscosity retention of the polymer.

4,598,120

DISPERSION COMPOSITIONS, A PROCESS FOR THEIR PRODUCTION AND THEIR USE

Wilhelm Thoma; Rolf Langel, and Walter Schröer, all of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 17, 1985, Ser. No. 724,140

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1984, 3415920

Int. Cl.[4] C08K *3/20*

U.S. Cl. 524—591 11 Claims

1. A dispersion composition in the form of an aqueous, spreadable coating or printing paste which comprises

(A) an aqueous dispersion of a polyurethane (Aa) or a mixture of polyurethane (Aa) and an aqueous dispersion of a poly(meth)acrylate (Ab),

(B) a carboxyl group-containing, aqueous thickener polymer solution,

(C) a self-crosslinking polyorganosiloxane mixture which comprises a polysiloxane containing SiH-groups and a polysiloxane containing Si-vinyl groups and

(D) a crosslinking agent for components (A) and (B).

4,598,121

COLD-CROSSLINKING POLYURETHANE DISPERSIONS, MANUFACTURE AND USE OF THE SAME

Josef Disteldorf; Hans-Jurgen Haage, and Horst Schnurbusch, all of Herne, Fed. Rep. of Germany, assignors to Chemische Werke Huls AG, Marl, Fed. Rep. of Germany

Filed Jun. 5, 1985, Ser. No. 741,359

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1984, 3431144

Int. Cl.[4] C08G *18/32*

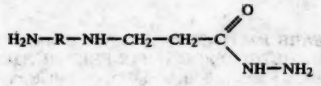
U.S. Cl. 524—874 10 Claims

1. A method for preparing an aqueous polyurethane dispersion, comprising:

(a) preparing a prepolymer with free NCO groups by reacting an aliphatic or cycloaliphatic polyisocyanate with a polyol, and an anionic compound;

(b) dispersing said prepolymer in water;

(c) reacting said water-dispersed prepolymer with a diamino hydrazide of the formula:



wherein R is an alkylene group of 2 to 15 carbon atoms or a cycloalkylene or arylene group of 6 to 15 carbon atoms as a chain-lengthening agent;

(d) reacting the prepolymer of step (c) in said dispersion with formaldehyde to effect crosslinking.

4,598,122

POLYOXIRANE CROSSLINKED POLYVINYL ALCOHOL HYDROGEL CONTACT LENS

Merrill Goldenberg, Riverdale, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 22, 1985, Ser. No. 693,484

Int. Cl.[4] C08F *8/00*

U.S. Cl. 525—61 12 Claims

1. An optically clear soft contact lens of a polyvinyl alcohol which is hydrolized to an extent of at least 93 mol percent and having a weight average molecular weight of at least 10,000 which is crosslinked with a dimensionally stabilizing effective amount of an organic multifunctional oxirane, such that the resulting lens has a water content between about 70 to 98 percent water, based upon the weight of cross-linked lens, and substantially retains its dimensional stability in boiling water.

4,598,123

IMPACT MODIFIED METHYL METHACRYLATE POLYMER

Louis A. Cutter, Allegheny County, Pa., assignor to Unites States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 513,546, Jul. 14, 1983, abandoned. This application May 1, 1985, Ser. No. 729,458

Int. Cl.[4] C08L *33/12, 51/04, 53/02*

U.S. Cl. 525—84 7 Claims

1. A casting syrup for making an impact-modified polymethylmethacrylate comprising about 0.1% to about 20% styrene, about 69 to about 87% methyl methacrylate, about 0.2% to about 2.0% of a peroxide initiator, and about 8 to about 14% of an ABA block copolymer having a weight ratio of A:B monomer of about 1:2 to about 1:3 wherein A is a chain of polystyrene, and B is a block of hydrogenated polybutadiene, and up to about 10% ethylene-propylene rubber.

4,598,124

MASS POLYMERIZATION PROCESS FOR ABS POLYBLENDS

Vincent A. Aliberti, Wilbraham; Robert L. Kruse, Belchertown, and Eduardo M. Valcarce, South Hadley, all of Mass., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 348,474, Feb. 12, 1982, abandoned, which is a continuation-in-part of Ser. No. 265,293, May 23, 1981, abandoned. This application Aug. 29, 1983, Ser. No. 527,137

Int. Cl.[4] C08F *279/04*

U.S. Cl. 525—86 4 Claims

1. An ABS polymer comprising:

(A) a graft copolymer formed by graft polymerizing styrene and acrylonitrile monomers onto an intially ungrafted, low gel diene rubber; and

(B) a copolymer of said grafted monomers in which said grafted copolymer is dispersed; said diene rubber comprising 3 to 25% by weight of said polymer; the polymerized acrylonitrile content of said polymer being 27 to 40% by weight; said A and B simultaneously formed by continuous mass polymerization from a substantially uniform reaction composition.

4,598,125

PREPARATION OF IMPACT-RESISTANT NYLON MOLDING MATERIALS BY ALKALINE LACTAM POLYMERIZATION

Peter Horn, Heidelberg; Hellmut Bünsch, Leimen; Robert Gehm, Limburgerhof, and Matthias Marx, Bad Durkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengellschaft, Fed. Rep. of Germany

Filed Dec. 30, 1983, Ser. No. 567,323

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1983, 3300363

Int. Cl.[4] C08F *8/30;* C08L *31/00*

U.S. Cl. 525—183 9 Claims

1. A process for the preparation of an impact-resistant nylon molding material by activated alkaline polymerization of lactams, wherein the polymerization is carried out in the presence of a graft polymer P, in which

A. from 5 to 95 parts by weight of an elastomeric polymer having a glass transition temperature below 0° C. and a molecular weight of from 500 to 5,000 from the grafting base for

B. from 95 to 5 parts by weight of a polyether containing an average from 0.2 to 2.0 olefinic double bonds per polymer molecule and which has a glass transition temperature above 0° C., with or without

C. from 9 to 90 parts by weight of vinyl monomers.

4,598,126

HEAT RESISTANT RESIN COMPOSITION

Sadao Ikuma, Suzuka; Yuji Aoki, Yockaichi, and Noboru Watanabe, Matsudo, all of Japan, assignors to Mitsubishi Monsanto Chemical Co., Tokyo, Japan

Division of Ser. No. 501,111, Jun. 6, 1983, Pat. No. 4,525,536.
This application Apr. 5, 1985, Ser. No. 720,266
Claims priority, application Japan, Jun. 21, 1982, 57-106553
The portion of the term of this patent subsequent to Apr. 26, 2000, has been disclaimed.
Int. Cl.[4] C08L *25/12, 33/24*
U.S. Cl. 525—194 5 Claims

1. A process for preparing a heat resistant resin composition which comprises bulk-polymerising a vinyl aromatic monomer with from 10 to 45 molar % of a maleic acid anhydride monomer to obtain a syrup composed substantially of a first copolymer and an unreacted vinyl aromatic monomer, adding a vinyl cyanide monomer to this syrup in such an amount that the content of the vinyle cyanide monomer residue in a second copolymer to be formed by its reaction with the unreacted vinyl aromatic monomer becomes from 20 to 55%, subjecting the mixture to suspension polymerization to polymerize the unreacted vinyl aromatic monomer with the vinyl cyanide monomer to form the second copolymer, then adding an aromatic amine and ammonia to the suspension system in a total amount by mole of from 0.8 to 1.5 times the amount by mole of the maleic acid anhydride to convert the maleic acid anhydride residue in the first copolymer to its imide.

4,598,127

COMPOSITIONS BASED ON MIXTURES OF ETHYLENE-ETHYL ACRYLATE COPOLYMERS AND ETHYLENE-VINYL ACETATE-VINYL CHLORIDE TERPOLYMERS

Kunio Kotani; Akio Hayashi, and Seiho Taniguchi, all of Yokohama, Japan, assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 21, 1985, Ser. No. 747,186
Claims priority, application Japan, Sep. 5, 1984, 59-184543
Int. Cl.[4] C08L *33/06*
U.S. Cl. 525—229 4 Claims

1. A composition having adhesion to and strippability from crosslinked olefin polymers comprising an ethylene-ethyl acrylate copolymer having a melt index of 1 to 50 grams/10 minutes and containing about 30 to about 50 percent by weight combined ethyl acrylate; and an ethylene-vinyl acetate-vinyl chloride terpolymer containing about 30 to about 85 percent by weight ethylene, about 5 to about 60 percent by weight combined vinyl acetate and about 10 to about 70 percent by weight combined vinyl chloride wherein the amount of terpolymer is about 18 to about 330 parts by weight per 100 parts by weight copolymer.

4,598,128

POLYMER COMPOSITION AND PREPARATION METHOD

James C. Randall, and William M. Whitte, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 14, 1983, Ser. No. 474,767
Int. Cl.[4] C08J *3/28;* C08L *22/06, 22/09*
U.S. Cl. 525—240 41 Claims

1. A composition comprising a blend of

(a) a first polymer selected from normally solid crystalline ethylene homopolymers and copolymers of ethylene containing up to about 20 mole percent of at least one comonomer selected from α-olefins having from about 3 to about 20 carbon atoms, said polymer having repeating units of the structure —CH_2— and a density greater than about 0.95 g/cm^3, and

(b) a second polymer selected from the group consisting of

(1) non-gelled, normally solid crystalline ethylene homopolymers having repeating units of the structure —CH_2— and at least about two long chain Y-branches per 10,000 carbon atoms and fewer than about 10 short chain branches per 10,000 carbon atoms;

(2) non-gelled, normally solid crystalline ethylene homopolymers and copolymers of ethylene containing up to about 20 mole percent of at least one comonomer selected from α-olefins having from about 3 to about 20 carbon atoms, having repeating units of the structure —CH_2— and a g value of less than about 0.9 and an intrinsic viscosity of less than about 3.0;

(3) non-gelled, normally solid crystalline ethylene homopolymers and copolymers of ethylene containing up to about 20 mole percent of at least one comonomer selected from α-olefins having from about 3 to about 20 carbon atoms, having repeating units of the structure —CH_2— and comprising molecules exhibiting a numerical excess of long chain Y-branching over short chain branching; and

(4) non-gelled, normally solid crystalline ethylene homopolymers and copolymers of ethylene containing up to about 20 mole percent of at least one comonomer selected from α-olefins having from about 3 to about 20 carbon atoms, having repeating units of the structure —CH_2— and comprising molecules having at least 2 long chain Y-branches per 10,000 carbon atoms and flow activation energy E^* greater than 20 kcal/mole.

14. In a polymer extrusion process in which a polymer selected from ethylene homopolymers and copolymers having a density greater than about 0.95 g/cm^3 is extruded in the melt and the extruded polymer is cooled to produce a solid polymer, a process comprising

prior to or during extrusion of the polymer, exposing a portion of the polymer in the melt to radiation under non-gelling, non-oxidizing conditions, wherein the extruded product comprises a mixture of high density ethylene polymer and Y-branched ethylene polymer.

4,598,129

BLOCK CARBONATE-CARBOXYLATE COPOLYESTERS AND METHOD FOR THEIR PREPARATION

Willem F. H. Borman, and Richard W. Campbell, both of Evansville, Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Oct. 23, 1979, Ser. No. 87,472
Int. Cl.[4] C08F *20/00*
U.S. Cl. 525—439 6 Claims

1. A process for the preparation of a thermoplastic carbonate-carboxylate copolyester which consists essentially of blocks derived from:

(a) a high molecular weight aromatic carbonate polymer; and

(b) a terminally-reactive aliphatic polyester of a straight chain aliphatic dicarboxylic acid having from 4 to 12 carbon atoms in the chain and a straight or branched chain aliphatic glycol which comprises heating in the presence of a catalyst for esterification:

(a) a high molecular weight aromatic carbonate polymer; and

(b) a terminally-reactive aliphatic polyester of a straight chain aliphatic dicarboxylic acid having from 4 to 12 carbon atoms in the chain and a straight or branched chain aliphatic glycol, until the formation of blocks connected by linkages consisting essentially of carbonate linkages or carboxylate linkages is substantially complete.

4,598,130

BLENDS OF A POLYARYLATE AND A POLY(ESTER CARBONATE)

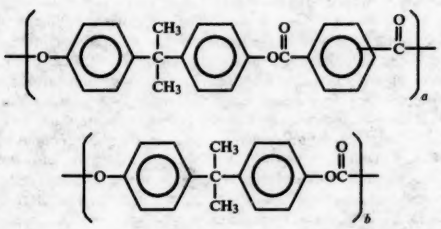
Lloyd M. Robeson, Whitehouse Station, N.J., and Donald M. Papuga, Danbury, Conn., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 468,086, Feb. 18, 1983, abandoned. This application May 10, 1985, Ser. No. 732,817

Int. Cl.[4] C08L 67/02, 69/00

U.S. Cl. 525—439 2 Claims

1. A blend consisting essentially of from about 30 to about 70 weight percent of a polyarylate prepared from bisphenol-A and a mixture of terephthalic and isophthalic acids and from about 70 to about 30 weight percent of a random poly(ester carbonate) of the following formula:



wherein a is from about 0.1 to about 0.9 and b is from about 0.9 to about 0.1.

4,598,131

CATALYSTS FOR CURABLE COATING VEHICLE BASED UPON AMINOALKYLOXY SILANES AND ORGANIC ISOCYANATES

Paul J. Prucnal, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

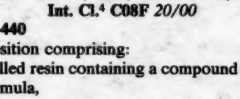
Filed Dec. 19, 1984, Ser. No. 683,737

Int. Cl.[4] C08F 20/00

U.S. Cl. 525—440 20 Claims

1. A composition comprising:

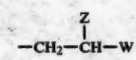
(A) an ungelled resin containing a compound corresponding to the formula,



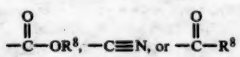
wherein

Q represents the residue of an organic isocyanate having an average isocyanate functionality of at least 1,

R^1 independently represents H, a C_1 to C_{10} alkyl radical, a C_1–C_{10} hydroxyalkyl radical or a radical corresponding to the formula



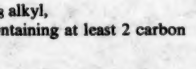
wherein Z represents H or C_1 to C_4 alkyl, and W represents



in which R^8 represents C_1 to C_8 alkyl,

X represents a divalent radical containing at least 2 carbon atoms,

A represents a monovalent silicon-containing group corresponding to the formula



wherein

R^2 independently represents hydrogen, a C_1 to C_{10} alkyl group, a C_4 to C_{10} cycloalkyl group, a C_6 to C_{10} aryl group, or a monovalent aminoalkyl group, that is attached directly to Si,

Y represents a hydrolyzable group that is attached directly to Si

m is an integer ranging from 1 to 5,

e is a positive integer wherein $1 \leqq e \leqq 11$, d is zero or a positive integer wherein $0 \leqq d \leqq 10$, and $3 \leqq d+e \leqq 11$, and wherein x is a positive number which is equal to or less than the average isocyanate functionality of said organic isocyanate; and

(B) an effective amount of a cure-accelerating catalyst selected from the group consisting of trifluoromethane sulfonic acid, a neutralization product of trifluoromethane sulfonic acid with ammonia, a neutralization product of trifluoromethane sulfonic acid with an amine, a tetraalkyl ammonium salt of trifluoromethane sulfonic acid, and a mixture thereof.

4,598,132

CATALYST SYSTEM AND THE USE THEREOF FOR THE PRODUCTION OF EPDM RUBBER

Manfred Beck, Cologne, Fed. Rep. of Germany, assignor to Bunawerke Huls GmbH, Marl, Fed. Rep. of Germany

Continuation of Ser. No. 623,090, Jun. 21, 1984, abandoned. This application Sep. 25, 1985, Ser. No. 780,322

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1983, 3326839

Int. Cl.[4] C08F 4/44

U.S. Cl. 526—142 5 Claims

1. In an improved process for the polymerization of mixtures comprising ethylene, propylene and a non-conjugated diene in a hydrocarbon diluent by copolymerizing the mixture components in the presence of a catalyst comprising:

(a) a vanadium compound,

(b) an aluminum halide of the formula $AlR_{3-n}X_n$, wherein R is C_1–C_8-alkyl, X is halogen and n is 1 to 2, and

(c) an ester,

wherein the improvement is that said ester is a polymer containing ester groups which has a degree of polymerization of from 5 to 1000, the catalyst composition is soluble in hexane, remains in the product copolymer rubber under working-up conditions, and the polymerization is carried out at a temperature of from 10° to 120° C.

4,598,133

ORGANIC GLASS FOR OPTICAL PARTS

Kazuo Makino, Gamagori; Akira Matsumoto, Takarazuka, and Hideo Kabeya, Gamagori, all of Japan, assignors to Ito Optical Industrial Co., Ltd., Gamagori, Japan

Filed Aug. 29, 1984, Ser. No. 645,363

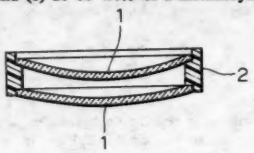
Claims priority, application Japan, Mar. 19, 1984, 59-53253

Int. Cl.[4] C08F 22/26

U.S. Cl. 526—322 10 Claims

1. Organic glass for optical parts which comprises a copolymer obtained by adding a polymerization initiator to a mixture of a monomer composition of (a) 30–85 wt% of diallyl iso-

phthalate, (b) 10–65 wt% of a benzoate ester with an unsaturated alcohol, and (c) 20–35 wt% of a methacrylate ester, a



polymer of the methacrylate ester having a refractive index of at least 1.55; and then polymerizing the mixture.

4,598,134

SILICONE PRIMER COMPOSITION

Kazuo Hirai, Ichihara, and Takao Matsushita, Kisarazu, both of Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Apr. 30, 1985, Ser. No. 728,989
Claims priority, application Japan, May 4, 1984, 59-89952
Int. Cl.[4] C08G 77/06
U.S. Cl. 528—17 11 Claims

1. A silicone primer composition consisting essentially of

Component (I) consisting of either

(A) consisting of an organosilicon compound in which at least one $A(RO)_2Si$ group and at least one silicon-bonded lower alkenyl group or silicon-bonded hydrogen atom are present in each molecule where A is an epoxy group-containing monovalent hydrocarbon group and R is a lower alkyl group; or

(B) consisting of a mixture of

(a) an organosilicon compound which contains silicon-bonded hydroxyl group and silicon-bonded lower alkenyl group or silicon-bonded hydrogen atom, and

(b) an organotrialkoxysilane with the general formula $ASi(OR^1)_3$ where A is as defined above and R^1 is an alkyl group;

Component (II) consisting essentially of a trialkoxysilane with the general formula $R^2Si(OR^3)_3$ or its partial hydrolysis condensation product where R^2 is a hydrogen atom or an organic group possessing an aliphatically unsaturated bond and R^3 is an alkyl group; and

Component (III) consisting essentially of an organotitanate ester.

4,598,135

METHOD FOR MAKING NORBORNANE ANHYDRIDE SUBSTITUTED POLYORGANOSILOXANE

Mark A. Buese, Ballston Spa, N.Y., assignor to General Electric Company, N.Y.

Filed Oct. 31, 1985, Ser. No. 793,360
Int. Cl.[4] C08G 77/06
U.S. Cl. 528—23 6 Claims

1. A method for making symmetric or asymmetric substituted norbornane anhydride terminated polydiorganosiloxane which comprises

(1) equilibrating under neat conditions in the presence of an effective amount of an equilibration catalyst a mixture comprising

(A) norbornane-dicarboxylic anhydride organosiloxane and

(B) organosiloxane consisting essentially of a member selected from the class consisting of cyclopolydiorganosiloxane, triorgano terminated polydiorganosiloxane, and a mixtures thereof,

(2) recovering norbornane anhydride terminated polydiorganosiloxane from the mixture of (1).

4,598,136

EMBEDDING MATERIAL AND PROCESS FOR THE PRODUCTION THEREOF

Gerhard Wick, Obernburg, Fed. Rep. of Germany, assignor to Akzo NV, Arnhem, Netherlands

Filed Mar. 26, 1985, Ser. No. 716,231
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1984, 3411361
Int. Cl.[4] B01D 13/00; C08G 18/22, 18/36
U.S. Cl. 528—56 20 Claims

1. Embedding material produced by a reaction of a stoichiometric excess of one or more aliphatic diisocyanates with castor oil, with or without further hydroxyl compounds, into a NCO group-displaying pre-adduct and reaction of the pre-adduct in the presence of metal compound as catalyst, with a chain-lengthener mixture containing castor oil, trimethylol propane and N-methyldiethanol amine.

9. Process for the production of an embedding material according to claim 1, through reaction of a stoichiometric excess of one or more aliphatic diisocyanates with castor oil, with or without further hydroxyl compounds, into a NCO-group-displaying pre-adduct and the further catalyzed reaction of the pre-adduct with a chain-lengthener mixture containing castor oil, trimethylol propane, and N-methyldiethanolamine, characterized in that the stoichiometric excess of aliphatic diisocyanate relative to the OH-groups of the hydroxyl compound amounts to at least 1 Val and the catalyzed reaction is carried out in the presence of catalytic amounts of a metal compound.

4,598,137

POLYARYLENE POLYETHERSULFONE IONOMERS

Michael D. Guiver, Ottawa; Oleh Kutowy, North Gower, and John W. Apsimon, Ottawa, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Nov. 30, 1984, Ser. No. 676,866
Int. Cl.[4] C08G 75/23
U.S. Cl. 528—173 14 Claims

1. A polyarylethersulfone copolymer having pendant carboxyl groups, formed by condensation of monomers comprising:

(a) a dihydric phenol monomer comprising 9,9-bis(4-hydroxyphenyl)-fluoren-4-carboxylic acid as alkali metal salt, and

(b) a dihalodiphenylsulfone where the halogen is selected from the chloro and fluoro groups; said monomers (a) and (b) being condensed in approximately equimolar amounts.

4,598,138

STABLE, PHENOLIC MODIFIED HYDROCARBON RESINS FOR LEUCOPIGMENTS

Wolfgang Lücke, Oberhausen; Herbert Beneke, Castrop-Rauxel, and Peter Stiglich, Duisburg, all of Fed. Rep. of Germany, assignors to Rütgerswerke Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Nov. 15, 1983, Ser. No. 548,693
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1982, 3246539
The portion of the term of this patent subsequent to Sep. 11, 2001, has been disclaimed.
Int. Cl.[4] C08G 65/40, 83/00
U.S. Cl. 528—205 13 Claims

1. A resin for developing of leucopigments which is a stable, phenolic-modified hydrocarbon resin with an OH number of at least 4.5.

4,598,139

COMPLEXES OF POLY (3,6-N-ALKYLCARBAZOLYL ALKENES)

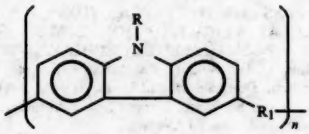
Samson A. Jenekhe, Bloomington, and Barbara J. Fure, Edina, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 626,565, Jun. 29, 1984, Pat. No. 4,548,738. This application May 24, 1985, Ser. No. 737,612

Int. Cl.[4] C08G 2/00

U.S. Cl. 528—248 4 Claims

1. A polymer comprising poly(3,6-N-alkylcarbazolyl alkenes) having the following structure:



where R is an alkyl group having from 1 to 3 carbon atoms, where R_1 is an alkene group having from 1 to 3 carbon atoms, and n is an integer having a value between 2 and 500.

4,598,140

COPPER (I)-PHENOXIDES USEFUL IN POLYPHENYLENE OXIDE PREPARATION

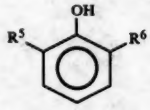
Deborah A. Haitko, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 20, 1984, Ser. No. 652,531

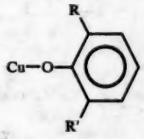
Int. Cl.[4] C08G 65/44

U.S. Cl. 528—215 8 Claims

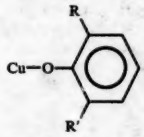
1. A method for preparing polyphenylene oxide which comprises oxidatively coupling a monohydroxy compound of the formula



in the presence of a catalytic amount of a catalyst system comprised of a copper (I)-xylenoxide of the formula



and a diamine of the formula



wherein R and R′ are each independently selected from the group consisting of hydrogen, alkyl radicals of from 1–7 carbon atoms and aryl radicals of from 6–13 carbon atoms, R″ is hydrogen or an alkyl radical, R‴ is an alkyl radical, subject to the proviso that R″ and R‴ taken together contain 2–6 carbon atoms, R^5 is selected from the group consisting of hydrogen and primary alkyl radicals of from 1–7 carbon atoms and R^6 is selected from the group consisting of hydrogen, primary alkyl radicals and secondary alkyl radicals of from 1 to 7 carbon atoms.

4,598,141

PROCESS FOR THE PREPARATION OF POLYESTERS OF IMPROVED DYE AFFINITY

Jürgen Fock, Düsseldorf, Fed. Rep. of Germany, assignor to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Mar. 1, 1985, Ser. No. 707,058

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1984, 3407562

Int. Cl.[4] C08G 63/68, 75/00

U.S. Cl. 528—293 7 Claims

1. A process for the preparation of polyesters with improved dye affinity which comprises reacting a dicarboxylic acid with a mixture of diols, said mixture comprising a major portion of an alkylene glycol and from 0.1 to 20 weight percent, based on the polyester, of a polyalkylene ether having the formula:

$$R^1CH_2O-(C_2H_4O-)_n(C_3H_7O-)_mCH_2CHR^3C-H_2-SO_3X$$

wherein

R^1 is $HO-CH_2-\underset{\underset{OH}{|}}{CH}-$, or $\underset{R^2}{\overset{HOH_2C}{\overset{CH_2OH}{C}}}-$,

wherein

R^2 is CH_3-, C_2H_5-, or C_3H_7-,

R^3 is H— or CH_3,

X is H—, alkali or ammonium ion,

n is 0 to 100,

m is 0 to 50, and

n+m is not less than 1.

3. A polyester having improved dye affinity prepared by reacting a dicarboxylic acid with a mixture of diols, said mixture comprising a major portion of an alkylene glycol and from 0.1 to 20 weight percent, based on the polyester, of a polyalkylene ether having the formula:

$$R^1CH_2O-(C_2H_4O-)_n(C_3H_7O-)_mCH_2CHR^3C-H_2-SO_3X$$

wherein

R^1 is $HO-CH_2-\underset{\underset{OH}{|}}{CH}-$, or $\underset{R^2}{\overset{HOH_2C}{\overset{CH_2OH}{C}}}-$,

wherein

R^2 is CH_3-, C_2H_5-, or C_3H_7-,

R^3 is H— or CH_3,

X is H—, alkali or ammonium ion,

n is 0 to 100,

m is 0 to 50, and

n+m is not less than 1.

4,598,142

COPOLYESTER ADHESIVES

Samuel D. Hilbert, Jonesborough, and Richard L. McConnell, Kingsport, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 29, 1985, Ser. No. 727,983
Int. Cl.[4] C08G 63/68, 75/00
U.S. Cl. 528—295 7 Claims

1. A crystalline copolyester adhesive composition, the copolyester having repeat units from the following:

(a) about 0.2–6 mol % of at least one difunctional sulfomonomer containing at least one metal sulfonate group attached to an aromatic nucleus wherein the functional groups are hydroxy or carboxy,

(b) at least one dicarboxylic acid selected from the group consisting of aliphatic, alicyclic and aromatic dicarboxylic acids having 2–20 carbon atoms,

(c) at least one glycol selected from the group consisting of aliphatic and alicyclic glycols having 2–12 carbon atoms,

(d) at least one dicarboxylic acid different from (a) and (b), having 2–20 carbon atoms, or at least one glycol different from (a) and (c) having 2–12 carbon atoms,

wherein the total of the acid and glycol components total 100 mol % each, and said copolyester having an I.V. of about 0.4–1.2, a heat of fusion of less than 12 calories per gram and a melting point of about 80° C.–180° C.

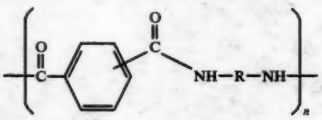
4,598,143

PROCESS FOR THE PREPARATION OF AROMATIC POLYAMIDE IN THE PRESENCE OF $SICL_4$

Walter Heitz, Kirchhain, and Peter Strohriegl, Coelbe/Buergeln, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 18, 1984, Ser. No. 683,002
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1983, 3347580; Jan. 5, 1984, 3400237
Int. Cl.[4] C08G 69/28
U.S. Cl. 528—336 6 Claims

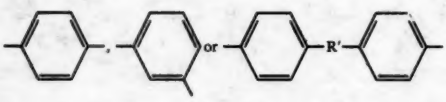
1. A process for the production of an aromatic polyamide containing recurring units of the formula



wherein

n is 2 to 200,

R denotes



in which

R' denotes a single bond or R' represents —CH_2—, —O—,

or —S—, mixed with SiO_2,

in which terephthalic acid, isophthalic acid or both are subjected to polycondensation reaction with an approximately equimolar amount of amine of the formula

$H_2N—R—NH_2$

wherein

R is defined above, in the presence of $SiCl_4$ and a solvent comprising a tertiary aromatic nitrogen heterocyclic compound, at a temperature of 60° C. to 200° C. and a pressure of 1 to 10 atmospheres, 1 to 2 moles of $SiCl_4$ being employed per mole of dicarboxylic acid.

4,598,144

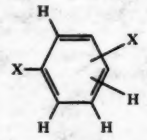
PROCESS FOR THE PRODUCTION OF HIGH MOLECULAR WEIGHT, OPTIONALLY BRANCHED POLYARYLENE SULPHIDES

Edgar Ostlinning, Duesseldorf; Karsten Idel, Krefeld; Wolfgang M. Eisermann, Duesseldorf, and Dieter Freitag, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

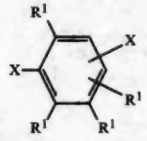
Filed Mar. 11, 1985, Ser. No. 710,557
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1984, 3410642
Int. Cl.[4] C08G 75/14
U.S. Cl. 528—388 10 Claims

1. A process for the production of a high molecular weight polyarylene sulfide comprising first, forming a reaction mixture of

(a) 50 to 100 mol % of a first dihaloaromatic material corresponding to the formula:



and 0 to 50 mol % of a second dihaloaromatic material corresponding to the formula:



wherein

X are halogen in the meta- or para- position to one another, and

R^1 can be the same or different and is hydrogen, alkyl, cycloalkyl, aryl, alkylaryl, arylalkyl, or two radicals R^1 in the ortho- position to each other linked together to form an aromatic or heterocyclic ring and one radical R^1 is invariably other than hydrogen,

(b) from 0 to 5 mol %, based on the sum of components (a) and (b), of a tri-or tetra-haloaromatic material corresponding to the formula:

ArX_n

wherein

Ar is an aromatic or heterocyclic radical,

X is halogen, and

n is 3 or 4

(c) an alkali metal sulfide or mixture thereof with an alkali metal hydroxide, the molar ratio of (a+b):c being from 0.85:1 to 1.15:1, and

(d) a polar organic solvent or mixture thereof with a catalyst, the molar ratio of the alkali metal sulfide (c) to the polar organic solvent (d) being from 1:12 to 1:15, and removing substantially all the water from the reaction mixture and second, reacting the dehydrated reaction mixture at a temperature from 160° to 270° C. in a vessel cascade comprising 2 to 6 vessels, where the reaction temperature is continuously raised over the individual reaction vessels.

4,598,145

ALBACARCINS V AND M

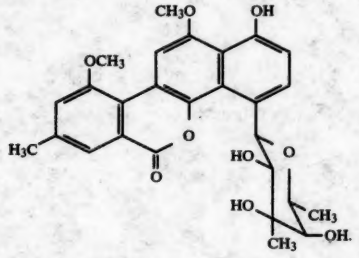
James A. Matson, Fayetteville; Robert W. Myllymaki, Syracuse; Terrence W. Doyle, and James A. Bush, both of Fayetteville, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 408,307, Aug. 16, 1982, Pat. No. 4,461,831. This application Apr. 16, 1984, Ser. No. 600,232

Int. Cl.⁴ C07H *7/04;* C12P *19/00*

U.S. Cl. 536—1.1 **2 Claims**

1. The antibiotic albacarcin M having the formula



4,598,146

COMPOUND, ARUGOMYCIN

Noboru Otake, Yokohama; Hiroyuki Kawai, Urawa; Yoichi Hayakawa, Tokyo; Masaya Nakagawa, Ichikawa; Kanji Imamura, and Kozo Tanabe, both of Takasaki, all of Japan, assignors to Kirin Beer Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1984, Ser. No. 583,180

Claims priority, application Japan, Mar. 4, 1983, 58-35663

Int. Cl.⁴ C07H *15/24;* C12P *19/56*

U.S. Cl. 536—6.4 **1 Claim**

1. An anthracycline compound, Arugomycin, having the following physicochemical properties:

(a) Color and form:
Orange powder;

(b) Melting point:
207° to 213° C. (decomposed);

(c) Specific rotatory power:
$[\alpha]_D^{25} = +112°$
(C: chloroform:methanol=9:1)

(d) Elementary analysis (%):

	C	H	O	N
Found	56.2	6.9	35.1	1.8
Calcd.	56.7	6.7	34.9	1.7;

(e) Ultraviolet and visible absorption spectrum: as shown in FIG. 1

	λ_{max} ($E^{1\%}_{1cm}$)
CH_3OH	235(363), 258(167), 292,(61), 476(104)
0.1N HCl + CH_3OH	235(387), 258(159), 292,(61),

-continued

	λ_{max} ($E^{1\%}_{1cm}$)
	468(110)
0.1N NaOH + CH_3OH	239(302), 294(41), 543(88);

(f) Infrared absorption spectrum (as measured by the potassium bromide method): as shown in FIG. 2;

(g) Solubility in solvent:
Easily soluble in a chloroform-methanol mixture, dimethyl sulfoxide, pyridine, and basic water;
Soluble in chloroform, methanol, ethyl acetate, methyl ethyl ketone, butanol, butyl acetate, ethanol, acetone, and acidic water, Sparingly soluble in water;

(h) Thin layer chromatograph (using "Silica Gel $60F_{254}$" plate supplied by Merck & Co., Inc.):

Developing solvent	Rf value
Chloroform:Methanol (8:1)	0.20
Chloroform:Methanol:29% Aqueous ammonia (8:1:0.1)	0.25
Chloroform:Methanol:Acetic acid (8:1:0.1)	0.30
Chloroform:Benzene:Methanol (7:2:2)	0.26;

(i) NMR spectrum (400 MHz, in deuterochloroform-deuteromethanol): as shown in FIG. 3;

(j) Molecular weight (SIMS): m/z 1694(M+H).

4,598,147

CEPHEM COMPOUNDS AND PROCESSES FOR PREPARATION THEREOF

Takao Takaya, Kawanishi; Hisashi Takasugi, Kohamanishi; Toshiyuki Chiba, and Kiyoshi Tsuji, both of Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

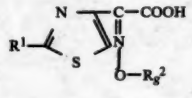
Continuation of Ser. No. 421,024, Sep. 22, 1982, abandoned, which is a division of Ser. No. 253,026, Apr. 10, 1981, Pat. No. 4,372,952, which is a division of Ser. No. 59,893, Jul. 23, 1979, Pat. No. 4,284,631. This application Dec. 3, 1984, Ser. No. 676,608

Claims priority, application United Kingdom, Jul. 31, 1978, 31694/78

Int. Cl.⁴ C07D *277/40*

U.S. Cl. 544—238 **7 Claims**

1. A compound of the formula:



wherein R^1 is amino or protected amino, and $R^2{}_g$ is lower alkyl of from one to six carbon atoms substituted with a substituent selected from the group consisting of amino, lower alkoxycarboxamido, lower alkenylthio, substituted phenyl with, amino (lower) alkyl or amido (lower) alkyl substituent, heterocyclic selected from the group consisting of furyl, pyrrolyl, imidazolyl, pyrazolyl, pyridyl, picolyl, pyrimidinyl, pyrazinyl, pyridazinyl, triazolyl, tetrazolyl, oxazolyl, isoxazolyl, oxadiazolyl, thiazolyl, isothiazolyl and thiadiazolyl, and substituted heterocyclic with at least one lower alkyl, hydroxy or amino substituent, and its ester and a salt thereof.

4,598,148

PYRIMIDO(6-1-A)ISOQUINOLIN-4-ONE DERIVATIVES

Bansi Lal; Horst Dornauer; Bani K. Bhattacharya; Alihussein N. Dohadwalla, and Noel J. de Souza, all of Bombay, India, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

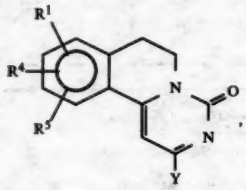
Division of Ser. No. 134,080, Mar. 26, 1980, Pat. No. 4,482,556, which is a continuation-in-part of Ser. No. 848,289, Nov. 3, 1977, abandoned. This application Sep. 19, 1984, Ser. No. 652,005

Claims priority, application Fed. Rep. of Germany, May 5, 1977, 2720085

Int. Cl.[4] C07D *491/052, 241/38, 491/048*

U.S. Cl. 544—252 **2 Claims**

1. A compound of the formula



wherein

R^1, R^4, and R^5, taken alone, are the same or different and are hydrogen, C_1–C_3 alkoxy, C_1–C_6 alkanoyloxy, or halogen, or any two of R^1, R^4 and R^5, in adjacent positions and taken together, are methylenedioxy or ethylenedioxy; and

Y is halogen, or alkoxy or alkylthio having up to 6 carbon atoms.

4,598,149

3-AMINO-2-HYDROXYPROPYL OF PYRIMIDIN-4-ONE USEFUL AS ANTIHYPERTENSIVE, CARDIOPROTECTIVE, ANTIARRYTHMIC, AND ANTIANGINAL AGENTS

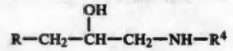
Gerald S. Ponticello, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 2, 1984, Ser. No. 585,739

Int. Cl.[4] C07D *239/02, 403/00;* A61K *31/505*

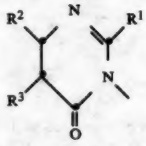
U.S. Cl. 544—319 **9 Claims**

1. A compound of structural formula



or a pharmaceutically acceptable salt thereof wherein:

R is



R^1 and R^2 are independently

(1) hydrogen,

(2) C_{1-3}alkyl, either straight or branched chain,

(3) phenyl or naphthyl either unsubstituted or substituted with 1 to 3 substituents selected from:

(a) fluoro, chloro and bromo

(b) C_{1-3}alkoxy, or

(c) C_{1-3}alkyl;

(4) heterocyclic aryl of 5 or 6 members, at least 4 of which are carbon atoms and the hetero atoms are O, N or S selected from pyridinyl, pyrazinyl, pyrimidinyl, thienyl, furyl and N-methylpyrryl;

R^3 is

(1) hydrogen,

(2) halo,

(3) methyl; and

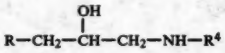
R^4 is

(1) C_{1-8}alkyl, either straight or branched chain,

(2) C_{3-6}cycloalkyl,

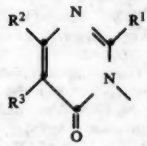
(3) aryl-C_{1-4}alkyl, wherein the C_{1-4}alkyl moiety is straight or branched chain, and the aryl moiety is phenyl or naphthyl, either unsubstituted or substituted with 1 or 2 substituents selected from C_{1-3}alkyl, C_{1-3}alkoxy, hydroxy and halo.

7. A method of producing an antihypertensive, cardioprotective, antiarrhythmic, and/or antianginal effect in a patient in need of such treatment which comprises the administration of an effective β-blocker amount of a compound of structural formula:



or a pharmaceutically acceptable salt thereof wherein:

R is



R^1 and R^2 are independently

(1) hydrogen,

(2) C_{1-3}alkyl, either straight or branched chain,

(3) phenyl or naphthyl either unsubstituted or substituted with 1 to 3 substituents selected from:

(a) halo,

(b) C_{1-3}alkoxy, or

(c) C_{1-3}alkyl;

(4) heterocyclic aryl of 5 or 6 members, at least 4 of which are carbon atoms and the hetero atoms are O, N or S selected from pyridinyl, pyrazinyl, pyrimidinyl, thienyl, furyl and N-methylpyrryl;

R^3 is

(1) hydrogen,

(2) halo, fluoro, chloro, and bromo

(3) methyl; and

R^4 is

(1) C_{1-8}alkyl, either straight or branched chain,

(2) C_{3-6}cycloalkyl,

(3) aryl-C_{1-4}alkyl, wherein the C_{1-4}alkyl moiety is straight or branched chain, and the aryl moiety is phenyl or naphthyl, either unsubstituted or substituted with 1 or 2 substituents selected from C_{1-3}alkyl, C_{1-3}alkoxy, hydroxy and halo.

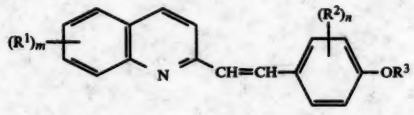
4,598,150

CHROMOGENIC 1-(3-METHOXY-4-ALKOXYPHENYL)-2-(2'-QUINOLYL-)ETHYLENE COMPOUNDS

Hideaki Fujisaki, Kyoto; Seiichi Nieda, Uji, and Katsuhiko Tsunemitsu, Kyoto, all of Japan, assignors to Yamada Chemical Co. Ltd, Kyoto, Japan

Filed Feb. 16, 1984, Ser. No. 580,604
Claims priority, application Japan, Feb. 18, 1983, 58-27142
Int. Cl.[4] C07D *215/14*
U.S. Cl. 546—152 2 Claims

1. A chromogenic compound of the formula:



wherein

R^1 and R^2 respectively represent a hydrogen atom or a lower alkoxy group of 1 to 5 carbon atoms, R^3 represents an alkyl group of 8 to 12 carbon atoms, and m and n are 1.

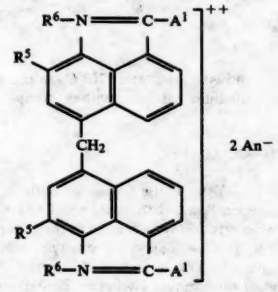
4,598,151

CATIONIC DYESTUFFS, A PROCESS FOR THEIR PREPARATION, AND THEIR USE FOR DYEING AND MASS-COLORING

Hans-Peter Kühlthau, Leverkusen, and Horst Harnisch, Much, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 15, 1982, Ser. No. 441,892
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1981, 3148104
Int. Cl.[4] C07D *209/90*
U.S. Cl. 546—167 3 Claims

1. A cationic dyestuff of the formula

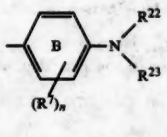


wherein

R^6 represents hydrogen, C_1- to C_4-alkyl optionally substituted by cyano, hydroxyl, or chlorine,

R^5 represents hydrogen, chlorine or bromine,

A^1 represents



wherein

R^{22} denotes hydrogen or C_1- to C_6-alkyl optionally substituted by 1-3 hydroxyl, 1-3 -halogen, or cyano,

R^{23} denotes C_1- to C_6-alkyl optionally substituted like R^{22}, benzyl or phenyl, or, together with the ring B, tetrahydroquinoline, optionally substituted by C_1- to C_4-alkyl groups,

R^7 denotes C_1- to C_4-alkyl, C_1- to C_4-alkoxy or halogen and n denotes 1 to 4, and

An^- represents an anion.

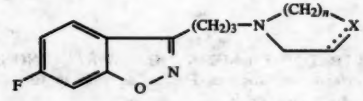
4,598,152

6-FLUORO-3-[3-(OXOHETEROCYCLO)PROPYL]-1,2-BENZISOXAZOLES

Larry Davis, Sergeantsville, and Joseph T. Klein, Somerville, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 366,245, Apr. 9, 1982, Pat. No. 4,458,075. This application Apr. 23, 1984, Ser. No. 602,781
Int. Cl.[4] C07D *413/06*
U.S. Cl. 546—198 2 Claims

1. A compound of the formula



wherein X is C=O and n is 1, 2 or 3; an optical antipode thereof or a pharmaceutically acceptable acid addition salt thereof.

4,598,153

METAPHIT, A SPECIFIC ACYLATING AGENT FOR THE [^{3}H] PHENCYCLIDINE

Kenner C. Rice, Rockville, Md.; Michael F. Rafferty, Ann Arbor, Mich.; Arthur E. Jacobson, Potomac; Patricia Contreras, Bethesda, both of Md.; Thomas L. O'Donohue, Silver Spring; Ralph A. Lessor, Bethesda, both of Md., and Mariena V. Mattson, Wheaton, Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Dec. 19, 1984, Ser. No. 683,428
Int. Cl.[4] C07D *295/12*
U.S. Cl. 546—229 1 Claim

1. Metaphit, 1-(1-(3-isothiocyanatophenyl)-cyclohexyl)-piperidine.

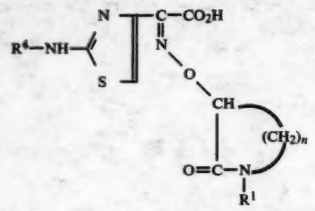
4,598,154

THIAZOLE INTERMEDIATES FOR CEPHALOSPORIN COMPOUNDS

Toyonari Oine; Hiroshi Sugano, both of Nara; Yoshihisa Yamada, Kyoto; Totaro Yamaguchi, Urawa, and Satoshi Ohshima, Iwatsuki, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Division of Ser. No. 516,053, Jul. 21, 1983. This application Jan. 18, 1985, Ser. No. 692,497
Claims priority, application United Kingdom, Aug. 7, 1982, 8222823
Int. Cl.[4] C07D *277/42*; A61K *31/545*
U.S. Cl. 548—194 4 Claims

1. A compound of the formula:



(II)

wherein R^1 is hydrogen or a lower alkyl group; R^4 is a protecting group; and n is an integer of 2 or 3 or a reactive derivative thereof.

4,598,155

3(5-TETRAZOLYL)1,4-DIAMINOANTHRAQUINONES

Jean-Marie Adam, Rosenau, France, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

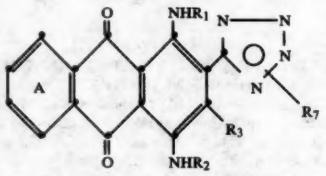
Filed Nov. 15, 1982, Ser. No. 441,829

Claims priority, application Switzerland, Nov. 18, 1981, 7410/81

Int. Cl.⁴ C07D *257/04*

U.S. Cl. 548—253 **7 Claims**

1. A 1,4-diaminoanthraquinone compound of the formula



wherein R_1 and R_2 independently of one another are each hydrogen; C_1–C_6alkyl or C_1–C_6alkyl substituted by hydroxy, C_1–C_4alkoxy or hydroxy-C_1–C_4alkoxy; C_5–C_8cycloalkyl or C_5–C_8cycloalkyl substituted by C_1–C_3alkyl; or phenyl or phenyl substituted by C_1–C_6alkyl, C_1–C_6alkoxy, halogen, nitro, NHCO-C_1–C_6alkyl, —COO—C_1—C_4alkyl or —COO—C_1—C_4hydroxyalkyl; R_3 is hydrogen, cyano, or $COOR_4$ or $CONR_5R_6$, wherein R_4 is C_1–C_{10}alkyl or C_1–C_{10}alkyl substituted by hydroxy, phenoxy, alkoxy or hydroxyalkoxy or is C_5–C_8cycloalkyl, and R_5 and R_6 independently of one another are each hydrogen or C_1–C_{10}alkyl, R_7 is C_1–C_{10}alkyl or C_1–C_{10}alkyl substituted by hydroxy, C_1–C_4alkoxy, phenyl or phenyl substituted by C_1–C_4alkyl, halogen or nitro, phenyl-C_1–C_3alkoxy, phenyl-C_1–C_3alkylthio, phenoxy, lower alkanoyl, lower alkanoyloxy, $—NR_8R_9$ or $—\oplus NR_8R_9R_{10}$ $An\ominus$ wherein R_8, R_9 and R_{10} independently are C_1–C_4alkyl or phenyl-C_1–C_4alkyl and $An\ominus$ is an anion, or COR_{12} wherein R_{12} is phenyl, C_1–C_6alkyl or C_1–C_6alkyl substituted by phenyl which is unsubstituted or substituted by C_1–C_4alkyl or halogen, and wherein the benzo radical A is not substituted or is substituted by halogen, hydroxy, C_1–C_4-alkoxy, hydroxy-C_1–C_4-alkoxy, phenoxy, C_1–C_4-alkylphenoxy, halophenoxy, nitro, amino, N-C_1–C_4-alkylamino, N,N-di-C_1–C_4-alkylamino, phenylamino, C_1–C_4-alkylphenylamino, C_1–C_4-alkoxyphenylamino or halophenylamino.

4,598,156

PROCESS FOR PRODUCING INDOLES UNSUBSTITUTED IN THE 2,3-POSITION AND N(3-CHLOROPROPIONYL)INDOLE PRODUCED THEREBY

Pierre Martin, Rheinfelden, Switzerland, assignor to Ciba Geigy Corporation, Ardsley, N.Y.

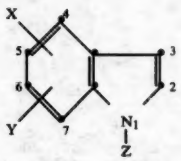
Filed Feb. 7, 1983, Ser. No. 464,528

Claims priority, application Switzerland, Feb. 10, 1982, 815/82

Int. Cl.⁴ C07D *209/02*

U.S. Cl. 548—501 **15 Claims**

1. A process for producing a compound of the formula I



(I)

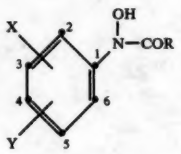
wherein

Z is hydrogen or a group —COR,

R is hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkyl, C_2–C_4-alkenyl, benzyl or phenyl,

X and Y independently of one another are each hydrogen, a halogen atom, C_1–C_4-alkyl, C_1–C_4-alkoxy, halomethyl, —OCO—C_1–C_4-alkyl, —CN, $—NO_2$, —NHCO—C_1–C_4-alkyl or phenyl,

which process comprises reacting a compound of the formula II



(II)

at a temperature of between 0° and 120° C., in the presence of a mercury or palladium catalyst, with a compound of the formula III

$$CH_2{=}CH{—}OCOR' \qquad \text{(III)}$$

wherein R, X and Y have the meanings defined under the formula I, and, when X and R together are $—CH_2CH_2—$, X is bound in the ortho position with respect to the group —N(OH-)—COR, and R' is C_1–C_4-alkyl or phenyl; and optionally saponifying a compound of the formula I in which Z is —COR to a compound of the formula I wherein Z is H.

15. N-(3-Chloropropionyl)-indole.

4,598,157

METHOD FOR THE MANUFACTURE OF PYROMELLITIC ACID DIANHYDRIDE

Helmut Scharf, Schermbeck, Fed. Rep. of Germany, assignor to Chemische Werke Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Mar. 28, 1985, Ser. No. 716,924

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1984, 3421301

Int. Cl.⁴ C07D *307/91*

U.S. Cl. 549—239 **8 Claims**

1. A method of separating pyromellitic acid dianhydride from the reaction gas obtained from the gas phase oxidation of 1,2,4,5-tetraalkylbenzene with an oxygen bearing gas in a closed gas circulatory system, comprising:

(a) desublimating pyromellitic acid dianhydride by contacting the product gas obtained from said gas phase oxidation reaction with a cold, oxygen bearing gas;
(b) catalytically burning the byproducts in the waste gas obtained from the desublimation step; and
(c) recirculating a proportionate amount of the byproduct free waste gas to the oxidation reactor for the gas phase oxidation reaction.

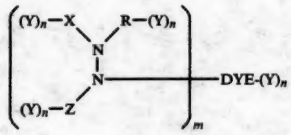
4,598,158

NOVEL IMAGE DYE-PROVIDING MATERIALS AND PHOTOGRAPHIC PRODUCTS AND PROCESSES

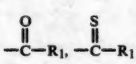
Stephen R. Herchen, Duxbury, and Gary N. Widiger, Lexington, both of Mass., assignors to Polaroid Corporation, Patent Dept., Cambridge, Mass.

Division of Ser. No. 331,995, Dec. 18, 1981, Pat. No. 4,386,150. This application Jan. 10, 1983, Ser. No. 456,978
Int. Cl.⁴ C07D *311/82*
U.S. Cl. 549—394 **7 Claims**

1. A compound represented by the formula



wherein X is



or $—SO_2—R_1$; Z is H, phenyl or naphthyl; R is H, alkyl, phenyl or naphthyl; provided that Z and R are not both H; DYE is a xanthene dye moiety; R_1 is H, alkyl, phenyl, naphthyl, $—NH_2$, $—NHR_2$,

or $—OR_2$; R_2 is H, alkyl, phenyl or naphthyl; m is 1 or 2; each Y is a substituent including at least one diffusion control moiety selected from the group consisting of a hydroquinonyl silver halide developing moiety, a color coupling phenol or naphthol moiety havng an available coupling position para to the hydroxyl group, a sulfonamidophenol group which will cleave or ring close following oxidation, a thiazolidine group which is capable of silver-catalyzed cleavage, and the group —E—Dev wherein Dev is a hydroquinonyl group and E is a covalent bond or a divalent linking group, and each n is 0 or 1 provided that at least one n is 1.

4,598,159

PROCESS FOR PRODUCING FURFURYLAMINE AND/OR TETRAHYDROFURFURYLAMINE

Tadashi Ayusawa; Shoichiro Mori; Tadamichi Aoki, and Ryozo Hamana, all of Ibaraki, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1984, Ser. No. 686,903
Claims priority, application Japan, Jan. 6, 1984, 59-581
Int. Cl.⁴ C07D *307/14, 307/52*
U.S. Cl. 549—492 **10 Claims**

1. A process for producing furfurylamine or tetrahydrofurfurylamine of a mixture thereof which comprises subjecting a mixture of furfural and a primary amine to a liquid-phase catalytic hydrogenation using a hydrogenation catalyst in the presence of ammonia, wherein said primary amine is furfurylamine or tetrahydrofurfurylamine or a mixture thereof, said hydrogenation catalyst is selected from the group consisting of cobalt-based catalysts and nickel-based catalysts, and wherein said hydrogenation is conducted in the presence of dioxane or in a non-solvent system, and wherein the amount of furfurylamine or tetrahydrofurfurylamine or a mixture thereof is at least one mole per mole of furfural.

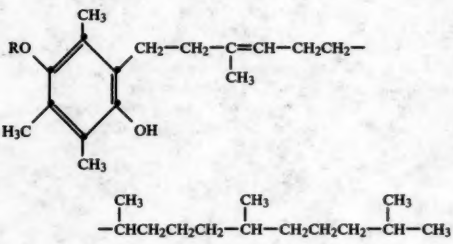
4,598,160

INTERMEDIATE PHENOLIC COMPOUNDS FOR THE CATALYTIC SYNTHESIS OF CHROMANS

Larry K. Truesdale, Nutley, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 514,134, Jul. 15, 1983, abandoned, which is a division of Ser. No. 372,858, Apr. 28, 1982, abandoned. This application Mar. 11, 1985, Ser. No. 710,193
Int. Cl.⁴ C07C *69/773, 39/19*
U.S. Cl. 560—144 **5 Claims**

1. A compound of the formula



wherein R is hydrogen, or when taken together with its attached oxygen atom, an ester protecting group removable by hydrolysis or an ether protecting group removable by hydrogenolysis or acid catalyzed cleavage.

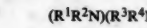
4,598,161

TRIS(DIALKYLAMINO)SULFONIUM BIFLUORIDE CATALYSTS

William B. Farnham, Wilmington, Del.; William J. Middleton, Chadds Ford, Pa., and Dotsevi Y. Sogah, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

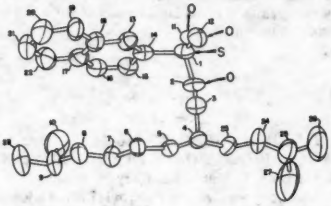
Filed Apr. 4, 1983, Ser. No. 481,927
Int. Cl.⁴ C07C *87/04, 149/00, 149/46*
U.S. Cl. 564—101 **14 Claims**

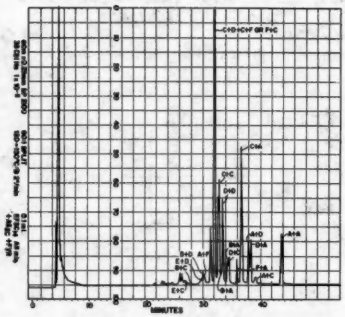
1. A compound of the formula



wherein the R groups individually are alkyl groups of one to

twenty carbon atoms, each alkyl group having at least 2 alpha-hydrogen atoms, or R^1 and R^2, R^3 and R^4, and R^5 and R^6, taken as individual pairs, can be $—CH_2—_4$ or $—CH_2—_2CHY—CH_2—_2$, where Y is hydrogen or methyl.





4,598,162

DETERGENT RANGE ALDEHYDE AND ALCOHOL MIXTURES AND DERIVATIVES, AND PROCESS THEREFOR

Denis Forster, St. Louis; George F. Schaefer, Olivette, and George E. Barker, St. Louis, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 499,967, Jun. 1, 1983, abandoned, and a continuation-in-part of Ser. No. 272,587, Jun. 11, 1981, Pat. No. 4,426,542, which is a continuation-in-part of Ser. No. 256,439, Apr. 22, 1981, abandoned, which is a continuation of Ser. No. 104,517, Dec. 17, 1979, abandoned. This application Nov. 4, 1983, Ser. No. 549,524

Int. Cl.[4] C07C *47/21*

U.S. Cl. 568—448 13 Claims

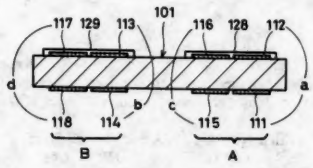
1. A mixture of isomeric enals having from 11 to 16 carbon atoms and characterized as 2-alkenals of 6 to 10 carbon atoms with an alkyl group containing 2 to 6 carbon atoms substituted in the 2-position thereof, and with additional branching in most of the isomers with most of the additional branches being methyl groups, and further characterized as being liquid at ambient temperatures and having hydrocarbon hydrophobe moieties making the mixture suitable for formation of effective detergents therefrom, and further characterized by suitable biodegradability.

4,598,163

PYROELECTRIC DETECTOR

Satoru Ito, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Jul. 9, 1984, Ser. No. 628,915
Claims priority, application Japan, Jul. 11, 1983, 58-126430
Int. Cl.[4] H01L *35/00*; G01J *5/00, 5/48*
U.S. Cl. 136—213 8 Claims



1. A pyroelectric detector having a functional portion comprising;

a pyroelectric material substrate (101) and

opposed electrodes (111 to 118) formed on both surfaces of said substrate (101) so that the polarization axes of said pyroelectric material substrate (101) are perpendicular to the surfaces of said electrodes,

said opposed electrodes constituting,, at least four or more and an even number of light receiving electrode portions (a, b, c and d),

the odd-numbered light receiving electrode portions (a and c) out of said light receiving electrode portions being classified as one light receiving electrode group A and the even-numbered light receiving electrode portions (b and d) being classified as the other light receiving electrode group B,

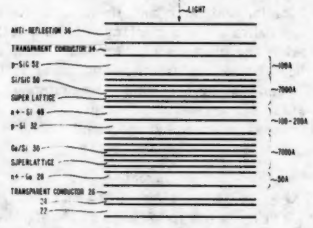
said odd-numbered light receiving electrode portions (a and c) and said even-numbered light receiving electrode portions (b and d) being electrically connected alternately and in series so that said light receiving electrode group A and said other light receiving electrode group B are of opposite polarities.

4,598,164

SOLAR CELL MADE FROM AMORPHOUS SUPERLATTICE MATERIAL

J. Thomas Tiedje, Lebanon, and Benjamin Abeles, Princeton, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Oct. 6, 1983, Ser. No. 539,470
Int. Cl.[4] H01L *31/06*
U.S. Cl. 136—249 11 Claims



1. A semiconductor device comprising:

a first photovoltaic cell which includes a first superlattice consisting essentially of a first multi-layered amorphous semiconductor material having a predetermined composition wherein the effective energy gap has a predetermined value which can be obtained by varying the thickness of the individual layers while maintaining said composition constant, said first superlattice material having an upper and lower surface, a first layer of n-doped amorphous semiconductor material forming a heterojunction with said lower surface, and a first layer of p-doped amorphous semiconductor material forming a heterojunction with said upper surface.

2. The semiconductor device of claim 1 further comprising:

(a) a second photovoltaic cell in optical tandem with said first photovoltaic cell, and

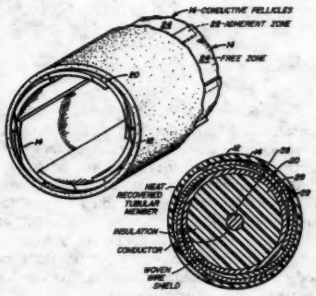
(b) means for electrically interconnecting said photovoltaic cell and said first superlattice such that current may flow therebetween, said interconnecting means being a layer of material adjacent to and between both of said photovoltaic cells.

4,598,165

CONFORMABLE ELECTROMAGNETIC SHIELD

James T. Tsai, 32760 Mono Lake La., Fremont, Calif. 94536

Filed May 1, 1985, Ser. No. 729,193
Int. Cl.[4] H01B *11/06*
U.S. Cl. 174—36 10 Claims



1. An article of manufacture for affording electromagnetic shielding around at least one exposed electrical conductor comprising a hollow tubular member formed of tubular heat recoverable material capable of existing in an expanded state in which a large diameter opening is formed and a recovered state in which a small diameter opening is formed, said tubular member being dimensioned so that said large diameter opening affords substantially unrestricted entry of a conductor in said opening, a plurality of conductive pellicles each having an axial extent and a circumferential extent, means forming an adherent zone on circumferential margin of each said pellicle at which each pellicle is adhered to the interior surface of said tubular member, the portion of each said pellicle remote from said adherent zone being a free zone, said pellicles being circumferentially spaced and dimensioned so that the free zone of each said pellicle overlaps the adherent zone of an adjacent pellicle in the expanded state, and so that in response to application of energy to said tubular member to effect recovery to the recovered state said free zones move smoothly along the respective surfaces of adjacent pellicles to effect complete circumscription of an electrical conductor by said pellicles.

4,598,166

HIGH DENSITY MULTI-LAYER CIRCUIT ARRANGEMENT

Wayne E. Neese, Hoffman Estates, Ill., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.

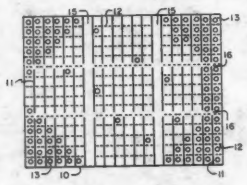
Filed Aug. 6, 1984, Ser. No. 638,176
Int. Cl.[4] H05K *1/14*
U.S. Cl. 174—68.5 10 Claims

1. A multi-layered circuit arrangement having at least a first combination comprising:

a first insulative substrate having a top and a bottom surface, said top surface including a first set of spaced and parallel

conductors having at least one transversely oriented break across each conductor isolating said first set of conductors into a first conductor group and a second conductor group, and said bottom surface including a second set of spaced and parallel conductors oriented perpendicular to said first set of conductors said second set of conductors having at least one transversely oriented break across each conductor isolating said second set of conductors into a third conductor group and a fourth conductor group, and a plurality of openings extending between said top and bottom surfaces, each opening located adjacent to an intersection of a different one of said first and second set of conductors;

a second insulative substrate having a top and a bottom surface and a plurality of plated through openings, said



second insulative substrate top surface attached to said first insulative substrate bottom surface with each of said second insulative substrate openings in registration with a respective one of said first insulative substrate openings, said second insulative substrate top surface further including first connecting means extending from at least one of said plated through openings and contacting one of said first insulative substrate's second set of conductors, and said second insulative substrate bottom surface including second connecting means extending from at least one of said plated through openings; and,

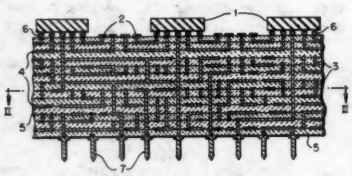
a third insulative substrate identical to said first insulative substrate having its top surface attached to said second insulative substrate bottom surface and said second insulative substrate second connecting means contacting one of said third insulative substrate's first set of conductors.

4,598,167

MULTILAYERED CERAMIC CIRCUIT BOARD

Nobuyuki Ushifusa; Satoru Ogihara, both of Hitachi, and Takanobu Noro, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 25, 1984, Ser. No. 634,066
Claims priority, application Japan, Jul. 27, 1983, 58-135882
Int. Cl.[4] H05K *1/00*
U.S. Cl. 174—68.5 **12 Claims**



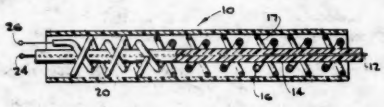
6. A multilayered ceramic circuit board formed of a plurality of unit ceramic circuit boards, each including a glass-containing ceramic layer, a patterned electrically conductive layer and through hole electrical conductors for connecting the patterned electrically conductive layers of the respective unit ceramic circuit boards to form a predetermined wiring circuit, wherein the glass-containing ceramic layers consist essentially of a low temperature softening glass with a softening point of 600° C. to 850° C. and a SiO_2 containing additive and have a dielectric constant of less than 5.7 and the patterned electrically conductive layers and the through hole electrical conductors consist essentially of a metal with a low resistivity and a SiO_2 containing filler, the pitch of the through holes formed in the glass-containing ceramic layers being less than 0.5 mm, whereby cracks in the vicinities of the through holes can be prevented.

4,598,168

STRAIN SENSITIVE CABLE

Gilbert F. Wagner, Vienna, Va., and Arthur C. Tiemann, Albuquerque, N. Mex., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 29, 1983, Ser. No. 555,916
Int. Cl.[4] G08B *13/12*; H01B *7/00*
U.S. Cl. 174—115 **5 Claims**



1. A strain sensing cable adapted to be coupled to a structure for detecting a physical stimulus imparting a strain thereto, said strain sensing cable comprising:

a. a first central conductor disposed along an axis of said strain sensing cable;

b. a layer of solid dielectric material surrounding said central conductor;

c. a second conductor configured as a helix and disposed loosely around said dielectric layer, said helix having an inner diameter selected to permit the free lateral or radial movement through a gas dielectric such as air of said second conductor with respect to said solid dielectric layer without compressing the solid dielectric material, whereby charges are built up within said dielectric layer upon the imposition of strain to said sensing cable and the resultant relative movement of said second conductor with respect to said dielectric layer; and

d. wherein the pitch and said helix configuration of said second conductor are selected to permit the free relative movement of said second conductor with respect to said solid dielectric layer and to resist deformation due to radially exerted forces towards said axis of said strain sensing cable, said pitch and the helical configuration being approximately within a range of about 1¼D to 1¼D, where D is the diameter of the second conductor, and with the axial spacing between successive turns of the helical second conductor being in an exemplary range of about ¼D to ¼D; and

e. a protective sheath disposed about said second conductor.

4,598,169

SYSTEM FOR DETECTING A MARKER SIGNAL INSERTED IN AN INFORMATION SIGNAL

Michimasa Komatsubara, Chiba; Takeshi Fukami; Akira Sakamoto, both of Tokyo; Takehiro Sugita, Chigasaki, and Toshiya Miyata, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 21, 1983, Ser. No. 563,979
Claims priority, application Japan, Dec. 24, 1982, 57-232258
Int. Cl.[4] H04L *9/00*
U.S. Cl. 178—22.04 **13 Claims**

1. A system for detecting a marker signal with a predetermined pattern in an information signal so as to compensate for timebase errors therein, said market signal being originally

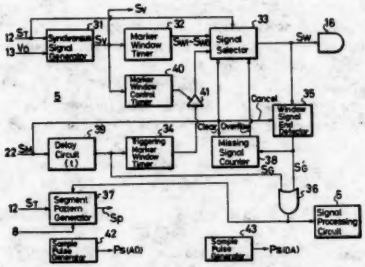
inserted periodically in said information signal, said system comprising:

means for repetitively generating first window signals and successively shifting said first window signals in a stepwise fashion during a predetermined interval;

detecting means receiving said first window signals as received window signals for detecting at least a portion of a marker signal in said information signal when at least sa' ! portion of the detected marker signal occurs during one of said received window signals;

means responsive to said received window signals for determining when said detected marker signal has said predetermined pattern and generating a net marker signal in response thereto; and

means responsive to said net marker signal for repetitively generating subsequent unshifted window signals each beginning at a predetermined time after the detection of a respective detected marker signal and for supplying said unshifted window signals to said detecting means as said received window signals in place of said first window signals for as long as said detecting means detects a portion of the detected maker signal during each received window signal.

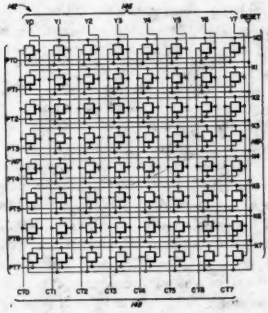


4,598,170

SECURE MICROPROCESSOR

Gerald V. Piosenka, Scottsdale, and Barry B. Mead, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 17, 1984, Ser. No. 611,560
Int. Cl.[4] H04L *9/00*
U.S. Cl. 178—22.08 **18 Claims**



11. A program security device, having an external and an internal data bus, comprising:

bidirectional bypass means for coupling said external and internal data buses, said bidirectional bypass means having a plain text data select, a first data bus and a second data bus, said plain text data select being coupled to receive a plain text data signal, said first data bus being coupled to said external data bus of said program security device and said second data bus being coupled to said internal data bus of said internal program security device;

conditional bidirectional inverter means for combining input data with a variable, said conditional bidirectional inverter having an output enable, an input enable, a cipher text data select, a first data bus, a second data bus and a variable input bus, said output enable being coupled to receive an output enabling signal, said input enable being coupled to receive an input enabling signal, said ciphered text data select being coupled to receive a ciphered text data signal and said first data bus being coupled to said external data bus of said program security device;

bidirectional permutor means for rearranging data bus lines, said permutor having a reset, a first data bus, a second data bus, a first program bus and a second program bus, said reset being coupled to receive a reset signal, said first data bus being coupled to said internal data bus of said program security device and said second data bus being coupled to said third data bus of said conditional bidirectional inverter means;

a seventh set of logic gates each having a first input, a second input and an output, said first inputs being coupled to a strobe line for receiving a strobe signal and said outputs being coupled to said fourth data bus of said permutor means;

a first register means having a first data bus and a second data bus, said first data bus being coupled to said second inputs of said seventh set of logic gates and said second data bus being coupled to a processor;

a storage device having a first data bus, a second data bus and a third data bus, said first data bus being coupled to said first data bus of said first register;

an eighth set of logic gates each having a first input, a second input and an output, said second inputs being coupled to said second data bus of said storage device;

a second register having a first data bus, a second data bus and a third data bus, said first data bus being coupled to said processor, said second data bus being coupled to said third data bus of said storage device and said third data bus being coupled to said first inputs of said eighth set of logic gates;

a decoder having a first data bus and a second data bus, said first data bus being coupled to said outputs of said eighth set of logic gates and said second data bus being coupled to said third data bus of said permutor means;

a ninth set of logic gates each having a first input, a second input and an output, said first inputs being coupled to said second data bus of said second register and said second inputs being coupled to said strobe line; and

a second array having a first data bus, a second data bus, a third data bus and a reset, said reset being coupled to receive said reset signal, said first data bus being coupled to said second data bus of said decoder, said second data bus being coupled to said outputs of said ninth set of logic gates and said third data bus being coupled to said second data bus of said conditional bidirectional inverter means.

4,598,171

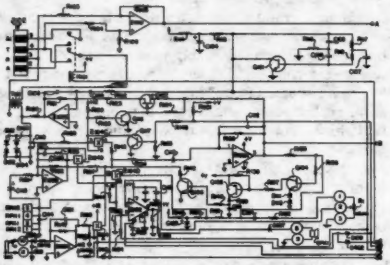
VOICE OPERATED TELEPHONE ANSWERING SYSTEM

Bradford E. Hanscom, Downey, and Gerald L. Mock, Corona, both of Calif., assignors to Fortel Corporation, Compton, Calif.

Filed Sep. 12, 1983, Ser. No. 531,461
Int. Cl.[4] H04M *1/64*
U.S. Cl. 179—6.14 **2 Claims**

1. In a telephone answering system which responds to telephone messages received over a telephone line and which causes a recorded announcement to be transmitted over the telephone line to a caller during a first time interval in response to a telephone call, and which includes a magnetic tape mechanism for recording messages received over the telephone line

during a second time interval following the first time interval; the combination of: a microcomputer; an input circuit adapted to be coupled to the telephone line for receiving audio signals therefrom during the second time interval representing a message from a caller and for recording the audio signals on the magnetic tape mechanism; an output circuit adapted to be coupled to the telephone line for transmitting to a caller during the first time interval audio signals representing the announcement; circuit means connecting a first port of the microcomputer to the magnetic tape mechanism to cause the magnetic tape mechanism to record the audio signals received from said input circuit so long as the output of said first port has a first predetermined value and to stop when the output of said first



port assumes a second predetermined value, further circuit means connected to said input circuit for digitizing the audio signals received from said input circuit; a differentiating circuit connected to said further circuit means for transforming the digitized audio signals into a series of pulses time-spaced from one another, said microcomputer causing said output of said first port to assume said first predetermined value so long as the time intervals between successive ones of said pulses are aperiodic, and causing said first port to assume said second predetermined value to stop said magnetic tape mechanism when the time intervals between successive ones of said pulses indicate that said input circuit is no longer receiving audio signals from said telephone line.

4,598,172

TELECOMMUNICATION TERMINAL

Erik A. Eriksson, Bandhagen, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

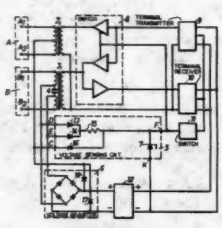
PCT No. PCT/SE84/00008, § 371 Date Aug. 29, 1984, § 102(e) Date Aug. 29, 1984, PCT Pub. No. WO84/03015, PCT Pub. Date Aug. 2, 1984

PCT Filed Jan. 13, 1984, Ser. No. 648,172

Claims priority, application Sweden, Jan. 19, 1983, 8300257

Int. Cl.[4] H04M *9/00*

U.S. Cl. 179—16 AA **2 Claims**



1. In a telecommunication terminal including a transmitter and a receiver and having first and second sets of wire terminals connectable to telecommunication wires for four-wire operation and only said first set is used for two-wire operation, the kind of operation being determined by the value of DC voltages received by the wire terminals from the telecommunication wires, apparatus for controlling the telecommunication terminal to operate in four-wire operation or two-wire operation in accordance with the values of the DC voltages present at the wire terminals, said apparatus comprising first and second transformers each having a center-tapped primary winding connected to a different one of said sets of wire terminals and a secondary winding, a DC voltage sensing means having first and second inputs connected to the centertaps of said first and second transformers, respectively, said DC voltage sensing means generating first and second control signals in accordance with the levels of signals present at said first and second inputs and first switch means responsive to said first control signal for operatively connecting the transmitter to the secondary winding of said first transformer and the receiver to the secondary winding of said second transformer and being responsive to said second control signal for operatively connecting the transmitter and receiver only to the secondary winding of said first transformer.

4,598,173

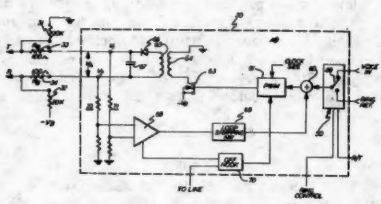
INTERFACE CIRCUIT FOR A SUBSCRIBER LINE CIRCUIT

Ramon C. W. Chea, Jr., Monroe; Kevin C. Keegan, Cromwell; Reddeppa N. Pothuri, and Albert H. Lloyd, Jr., both of Shelton, all of Conn., assignors to ITT Corporation, New York, N.Y.

Filed Oct. 15, 1984, Ser. No. 660,591

Int. Cl.[4] H04M *19/02, 3/02*

U.S. Cl. 179—18 FA **10 Claims**



1. An interface circuit for a subscriber line circuit for use in a telephone exchange, said line circuit having a two wire line with each wire coupled to a central office battery via a separate feed resistor; said interface circuit comprising:

a controllable amplifier means including a floating switching converter having, as an integral part thereof, a capacitor coupled across said two wire line and operative to supply an auxiliary voltage to said line;

means, coupled to said line to monitor the voltage across said capacitor, for providing a feedback control signal for said amplifier means;

a first adder having one output thereof coupled to said converter for controlling said auxiliary voltage across said capacitor, a first input of said adder being coupled to receive said feedback control signal and a second input thereof being adapted to receive input signals for said line circuit;

off hook detector means operative to provide an output signal when said subscriber line goes off hook for controlling said amplifier means to cause said amplifier means to operate during said off hook condition; and

ring control logic detection means coupled to said amplifier means for detecting the presence of a ring control signal applied to said line and for providing an output for controlling said amplifier means to generate a ringing signal during the presence of said ring control signal whereby said amplifier means, as controlled, is operative only dur-

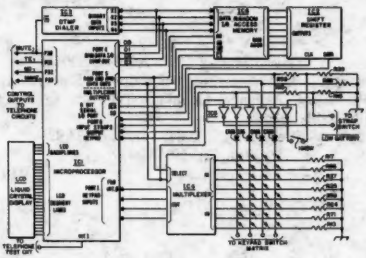
ing the presence of a ring control signal and during an off hook condition of said line.

4,598,174

CIRCUIT FOR DETECTING KEYPAD CONDITIONS IN A MICROPROCESSOR CONTROLLED TELEPHONE INSTRUMENT

Karl E. Pommer, II, Huntsville, Ala., assignor to GTE Communication Systems Corp., Northlake, Ill.

Filed Nov. 13, 1984, Ser. No. 670,084
Int. Cl.[4] H04M *1/00*
U.S. Cl. 179—84 VF 8 Claims



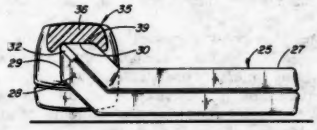
8. A circuit arrangement as claimed in claim 4 wherein: the output voltage from said strap switch is decoupled by a resistor element to inhibit any effect on output data from said microprocessor to said keypad control lines.

4,598,175

TELEPHONE SET WITH TWO POSITION MOUNTING WITH ALTERNATE SEATING OF HANDSET

Clifford D. Read, Almonte, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Nov. 28, 1983, Ser. No. 555,624
Int. Cl.[4] H04M *1/02*
U.S. Cl. 179—100 C 6 Claims



1. A telephone set having a base and a handset on the base; said base comprising:

a flat rectangular main body portion having planar rectangular front and back surfaces extending parallel to each other, parallel side edges, and top and bottom edges extending normal to said side edges;

a central projecting portion extending forward of said front surface and upward from said top edge, said projecting portion having a front surface extending forward of and parallel to the plane of the front surface of the main body portion, and also having a top surface spaced from and extending parallel to the top edge of the main body portion, said top and front surfaces of the projecting portion joined to define a corner positioned forward of the front surface of the main body portion and above said top edge of said main body portion;

and a hook switch actuating member extending through said corner;

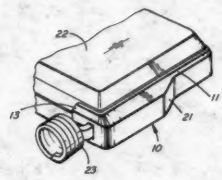
said handset comprising a center portion extending between transmitter and receiver housings, said center portion including an elongate recess in an undersurface thereof, said recess including a bottom surface; said recess dimensioned to sit over the projecting portion, the bottom surface of said recess resting on said front surface of said projecting portion when said base is on a horizontal surface, and said bottom surface of said recess resting on said top surface of said projecting portion when said base is positioned on a vertical surface, said corner being in said recess and the bottom surface of the recess in contact with and depressing said hook switch actuating member when said handset rests on said base.

4,598,176

TELEPHONE HANDSET CORD GUIDE AND RETAINER

Desmond J. Ryan, and Friedrich Bertignoll, both of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jun. 11, 1984, Ser. No. 619,042
Int. Cl.[4] H04M *1/15*
U.S. Cl. 179—103 7 Claims



1. A telephone handset cord guide and retainer comprising:

a web portion having a front surface, and ends;

an arm extending at each end of said web portion, the arms extending from said front surface and defining, with said web portion, a channel shape;

said web portion incuding a portion of increased thickness extending along the web portion from one end of the web portion, the increased thickness extending in a direction away from said front surface;

a recess extending into said portion of increased thickness from said front surface;

an aperture extending through the arm at said one end, the aperture extending to said recess; and

means on each arm for engagement with a handset housing to retain the cord guide and retainer on an end surface of the handset housing.

4,598,177

HEARING AID WITH SELF-CONTAINED BATTERY COMPARTMENT AND VOLUME CONTROL

Joseph F. McGroarty, Chicago, Ill., and Thomas D. Houlihan, Plymouth, Minn., assignors to Sears, Roebuck, & Co., Chicago, Ill.

Filed Jan. 16, 1985, Ser. No. 692,068
Int. Cl.[4] H04R *25/02*
U.S. Cl. 179—107 E 38 Claims

1. In a hearing aid of the self-contained type, the improvement comprising:

a unitary housing shaped for insertion into an ear of a wearer, said housing having a face plate adapted to face outwardly of the ear of the wearer;

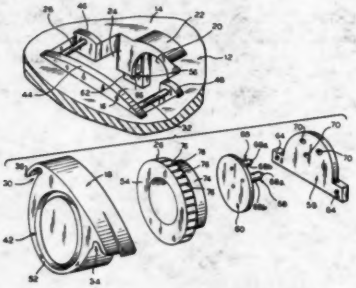
a first opening in said face plate defining a battery compartment, said battery compartment normally being concealed by a pivotable door movable from a closed position to an open position, said door in said open position providing access to said battery compartment;

a wheel mounting cavity within said unitary housing in laterally spaced relation to said battery compartment, said cavity being defined in part by an outer wall integral with said end plate;

a second opening in said face plate defining a volume control wheel compartment, said compartment being disposed between said battery compartment and said wheel mount-

ing cavity, said compartment being in communication with said wheel mounting cavity; and

a volume control wheel disposed in said volume control wheel compartment, said wheel being mounted for rotational movement by support means rigidly secured within said wheel mounting cavity and extending into said volume control wheel compartment, said wheel having at least a portion thereof projecting above said face plate;



said pivotable door concealing said battery compartment projecting above said face plate on one side of said volume control wheel, said outer wall defining said wheel mounting cavity projecting above said face plate on the other side of said volume control wheel, said volume control wheel having at least a portion of its outermost peripheral extent projecting above said pivotable door and said outer wall;

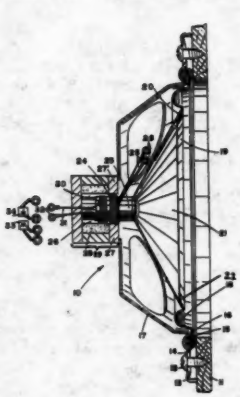
whereby said volume control wheel is adapted for manipulation by a finger of the wearer.

4,598,178

MEANS FOR CRITICALLY DAMPING A DYNAMIC LOUDSPEAKER

William L. Rollins, 704 30th St., Monroe, Wis. 53566

Filed Dec. 16, 1983, Ser. No. 562,281
Int. Cl.[4] H04R *9/04, 3/08, 9/00, 1/28*
U.S. Cl. 179—115.5 VC **3 Claims**



1. In a moving coil dynamic loudspeaker embodying a stationary magnet with pole pieces and an axially biasable assembly of a speaker diaphragm, a support member fixedly attached to said diaphragm, and a drive coil carried on said support member wherein said drive coil is disposed between said pole pieces of said speaker magnet, an improvement for damping motion of said assembly at extreme excursion comprising:

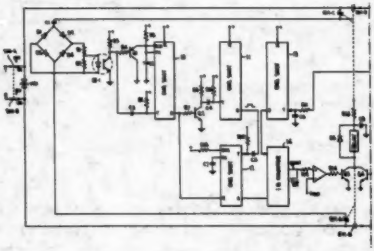
a short circuited electrical conductor provided as a coil carried on said support member and displaced axially from said drive coil on said support member a distance sufficient that said short circuited electrical conductor coil enters into a position intermediate said pole pieces only when said assembly approaches maximum excursion, said short circuited electrical conductor coil provided with leads connected to terminals, said terminals being provided to enable impedance of said short circuited electrical conductor coil to be selectively determined by replaceable provision of reactance circuit element means.

4,598,179

TELEPHONE PRIVACY SYSTEM

Lloyd E. Clark, Millersville, and Ralph E. Emery, Edgewater, both of Md., assignors to Sakura Telecommunications, Inc., Millersville, Md.

Filed Jun. 28, 1984, Ser. No. 625,825
Int. Cl.[4] H04M *15/06*
U.S. Cl. 179—84 C **19 Claims**



1. A telephone privacy system for use in conjunction with a user's telephone line and receiver/transmitter unit for permitting the user to screen incoming calls, without answering the calls, on the basis of a coded identification signal transmitted by a calling party on the telephone line, said system comprising:

first means responsive to said coded identification signal received on the user's telephone line for automatically providing a plurality of audio tones in a sequence which is determined by the receive coded identification signal; and

second means for rendering said plurality of audio tones audible externally of said system;

wherein plural different coded identification signals can be employed in said system to uniquely identify respective authorized callers, and wherein said first means comprises:

decoder means responsive to received coded identification signals for providing respective decoded address signals representing the coded identification in the received signal; and

tune generator means for providing said plurality of tones as a recognizable tune determined by the decoded address signal.

4,598,180

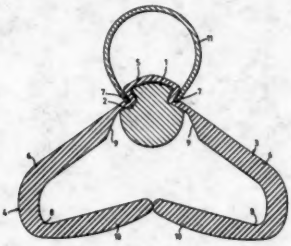
OVERHEAD ELECTRIC TRACTION SYSTEMS

Alan E. Seddon, Rainford, and Joseph Littler, Liverpool, both of England, assignors to BICC Public Limited Company, London, England

Filed Jan. 9, 1981, Ser. No. 223,906
Int. Cl.[4] B60M *1/04*
U.S. Cl. 191—35 **9 Claims**

1. In an overhead electric traction system comprising an overhead contact wire from which current is collected by means of an elongate current collector which extends transversely of the overhead contact wire and which is carried by a

travelling vehicle, the overhead contact wire is enclosed throughout substantially the whole of its length within an elongate protective cover of electrically insulating material, the elongate protective cover being secured to the contact wire, being substantially symmetrical about a longitudinally extending vertical plane passing through the axis of the contact wire and having a pair of transversely extending base walls which underlie and are spaced from the contact wire and abut



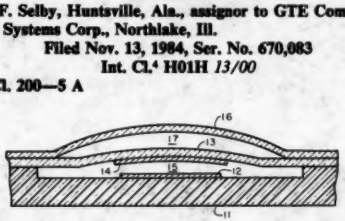
in or adjacent said vertical plane and which, when engaged by a transversely extending elongate current collector carried by a travelling vehicle, will be deflected upwardly and outwardly away from one another to expose the running surface of the contact wire and permit the current collector to effect electrical contact with and collect current from the contact wire and which, after passage of the current collector, will return to their original undeflected positions so that the contact wire is again enclosed within the cover.

4,598,181

LAMINATE SWITCH ASSEMBLY HAVING IMPROVED TACTILE FEEL AND IMPROVED RELIABILITY OF OPERATION

Steve F. Selby, Huntsville, Ala., assignor to GTE Communication Systems Corp., Northlake, Ill.

Filed Nov. 13, 1984, Ser. No. 670,083
Int. Cl.[4] H01H *13/00*
U.S. Cl. 200—5 A **1 Claim**



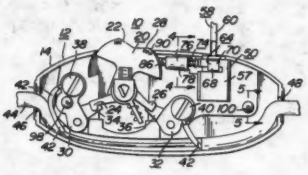
1. A laminate switch assembly comprising: a printed circuit board including a recessed portion and having at least one electrical contact area formed thereon; a first switch plate having a tensioned dome aligned with said electrical contact area on said circuit board; a second switch plate having a tensioned tactile dome positioned over said tensioned dome of said first dome switch plate; said first and said second switch plates formed of a thermal plastic material; said domes on said first and second switch plates both arched in an upward direction; said tensioned tactile dome arched substantially higher than said tensioned dome; said tactile dome contacting said tensioned dome when depressed; and contact means comprising an electrically conductive coating on the interior surface of said tensioned dome, interposed between said circuit board and said first switch plate for providing an electrical connection to said contact area responsive to depression of said tactile dome.

4,598,182

LOCK INHIBITOR FOR TOGGLE SWITCH ACTUATOR

Daniel V. Breslin, 7934 Ridge Ave., Philadelphia, Pa. 19128

Filed Apr. 4, 1984, Ser. No. 596,600
Int. Cl.[4] H01H *9/28*
U.S. Cl. 200—43.11 **9 Claims**



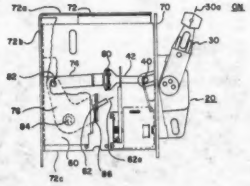
1. A lockable switch means for an electric cord comprising a housing, a switch having "on" and "off" positions retained within the housing and having a control means operative from outside of the housing for moving the switch between its "on" and "off" positions, a lock having locked and unlocked conditions contained within the housing for being key-actuated between locked and unlocked conditions from outside the housing, terminal means provided within the housing for electrically engaging and connecting with the switch an electrical cord received within the housing for opening and closing a circuit therethrough by actuation of the switch, and interengagement means actuated by the lock for engaging the switch and locking the switch against movement when the lock is in its locked condition and disengaging and unlocking the switch to allow it to be respectively moved between its "on" and "off" positions when the lock is retained in its unlocked condition, the switch is a toggle switch with a control lever pivotable between a first "on" position and second "off" position, and the interengagement means engages and disengages the lever for locking and unlocking the switch.

4,598,183

TRIP INDICATING CIRCUIT BREAKER OPERATING HANDLE

Jeffrey B. Gardner; Gerald J. Kuiper, both of Columbia, S.C., and Richard A. Nelson, Winston-Salem, N.C., assignors to Square D Company, Palatine, Ill.

Filed Jul. 27, 1984, Ser. No. 634,947
Int. Cl.[4] H01H *9/20*
U.S. Cl. 200—50 A **14 Claims**



6. A circuit breaker operating apparatus, said apparatus of the type having an enclosure, said circuit breaker mounted inside said enclosure, said circuit breaker having an operating toggle, said operating toggle having an "off" position, an "on" position, a "trip" position, and a "reset" position, said apparatus having a handle mounted on the exterior of said enclosure, said handle having a hand lever mounted for rotational motion relative to said enclosure, comprising:

a guide fixedly attached to said handle;

a cam link, said cam link having a first end rotatably attached to said hand lever, and said cam link having a second end slidably attached to said guide so that as said handle is

pivoted said second end of said cam link moves along said guide; and,

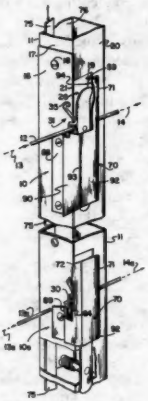
an operating bail moveably linked to said second end of said cam link, and said operating bail also moveably linked to said toggle of said circuit breaker so that as said hand lever is pivoted into a first position said toggle is moved into said "off" position, as said hand lever is pivoted into a second position said toggle is moved into said "on" position, as said hand lever is pivoted into a third position said toggle is moved into said "reset" position, and as said toggle is urged into said "trip" position as a result of said circuit breaker going into a trip condition then said hand lever is pivoted into a fourth position by action of said toggle as an indication that said circuit breaker is in said trip condition.

4,598,184

THREAD TENSION MONITORING AND CLAMPING APPARATUS

Gordon L. Price, Fairfax, Ala.; Howard G. Ruddick, West Point, and Henry R. Cook, LaGrange, both of Ga., assignors to West Point Foundry and Machine Co., West Point, Ga.

Filed Apr. 16, 1985, Ser. No. 723,888
Int. Cl.[4] B65H *49/00*
U.S. Cl. 200—61.18 **12 Claims**



1. Apparatus for clamping and detecting breakage of a tensioned thread, comprising:

support means having a surface extending adjacent to a predetermined path of thread travel;

clamp means mounted in closely spaced relation to said surface with said thread path located between the surface and the clamp means;

means operatively associated with said clamp means to selectably move the clamp means toward said surface and thereby clamp a thread disposed in said path of travel;

a sensing member mounted alongside said surface and operative to move on a path crossing said path of thread travel;

means biasing said sensing member to move across the path of thread travel;

means operatively engaging said sensing member and selectively displacable by a thread being introduced to the thread travel path through the space between said clamp means and said surface, said displacement being operative to deflect the sensing member in opposition to said biasing means and thereby permit the thread to enter said space, so that the sensing member is thereafter deflected by predetermined tension maintained in said thread; and

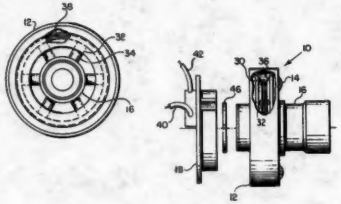
means responsive to said sensing member and operative to signal when the sensing member moves across the path of thread travel, so as to indicate the absence of a thread in the thread path.

4,598,185

UNIVERSAL CENTRIFUGAL SWITCH ASSEMBLY

Harry O. Moore, Charlotte, N.C., assignor to Chris Combis, Charlotte, N.C., a part interest

Filed Jul. 29, 1985, Ser. No. 760,020
Int. Cl.[4] H01H *35/10*
U.S. Cl. 200—80 R **10 Claims**



1. A universal centrifugal switch assembly, comprising: a fixed base provided with a hole centered therein;

a pair of spaced apart, substantially semicircular, slip rings of the same diameter fixed onto said base concentric with the hole in said base, said slip rings defining a pair of spaces between their ends;

non-conducting insulating material fixed within said slip rings and located in said spaces between said slip rings and forming a tubular receptacle within and concentric with said rings;

a rotatable shaft journaled within said tubular receptacle;

bearing means carried by and within said tubular receptacle between said tubular receptacle and said shaft;

a spider ring housing fixed to said rotatable shaft;

a spider ring connected to said spider ring housing, said spider ring being provided with a plurality of radial openings for accommodating conducting elements therein;

a plurality of conducting elements, on positioned in each radial opening in said spider ring and extending radially outwardly from said shaft;

compression means circumscribing said spider ring, said compression means having a predetermined tension, whereby said compression means acts in the operative mode to urge said conducting elements into engagement with said slip rings until overcome by centrifugal force.

4,598,186

VENT ARRANGEMENT FOR HIGH AMPERAGE MOLDED CASE CIRCUIT BREAKER

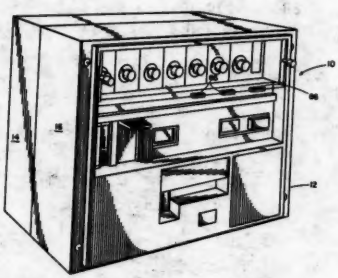
James W. Cook, Solon, and Tery J. Evans, Cedar Rapids, both of Iowa, assignors to Square D Company, Palatine, Ill.

Filed May 9, 1983, Ser. No. 493,112
Int. Cl.[4] H01H *33/08*
U.S. Cl. 200—144 R **9 Claims**

1. In a multiphase molded case circuit breaker including a plurality of contact blades for each phase arranged to carry alternating current in a selected range between 800 and 3000 amperes, with each blade carrying a blade contact intermediate the ends of the respective blade and having a respective carrier for each phase adapted to pivot a free end of the respective blades in one direction about a blade pivot axis for engaging a respective stationary contact to establish a connection between a line conductor and a load conductor for each phase with each contact adapted to generate an arc in response to pivot movement of the respective carrier and the respective blades in the opposite direction during current interruption under the influence of respective overtravel springs located between each carrier and the respective blades, the improvement comprising:

a molded base formed of insulating material for carrying said line and load conductors with said base having an opening formed therein for each phase with each opening spaced from the free ends of the respective blades and from the contacts of the respective phase,

an arc plate stack for each phase comprising a plurality of spaced apart runners located between a respective opening and the free ends of the respective blades and defining



stacked arc suppressor passages extending transverse to the path of the free ends of said blades during pivot movement in said opposite direction for transmitting an arc in the direction of the respective opening,

and a molded member of insulating material for each phase having a plurality of passages in asymmetrically spaced apart positions located in each base opening to control the pressure generated during an arc for facilitating extinction of the arc.

4,598,187

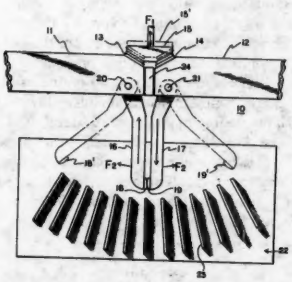
CURRENT LIMITING CIRCUIT BREAKER

Edward K. Howell, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed Nov. 26, 1984, Ser. No. 674,810

Int. Cl.[4] H01H *33/18*

U.S. Cl. 200—147 R **11 Claims**



1. A current limiting circuit interrupter contact assembly comprising:

a pair of rigid conductor means having a pair of stationary contacts attached to one end of each of said rigid conductor means;

bridging contact means movably associated with said stationary contacts for making and interrupting a conductive path between said rigid conductor means across said stationary contacts by means of an opening force applied to said bridging contact upon occurrence of an overcurrent through said stationary contacts; and

a pair of movable contact arms pivotally arranged at one end on said rigid conductor means, and a pair of movable contacts, each of said movable contact arms having one of said movable contacts at an opposite end for providing electrical connection between said movable contact arms, said movable contact arms being arranged side by side for electrodynamic repulsion to open said movable contacts independent of said opening force after said bridging contact has interrupted said conductive path through said stationary contacts.

4,598,188

GAS-BLAST SWITCH

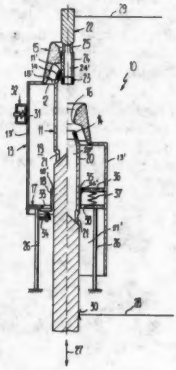
Hans-Jörg Schötzau, Unterentfelden; Renzo Coccioni, Niedergösgen, and Christian Sturzenegger, Wettingen, all of Switzerland, assignors to Sprecher & Schuh AG, Aarau, Switzerland

Filed Oct. 29, 1984, Ser. No. 665,714

Claims priority, application Switzerland, Nov. 15, 1983, 6128/83

Int. Cl.[4] H01H *33/88*

U.S. Cl. 200—148 A **9 Claims**



1. A gas-blast switch comprising:

two contact elements constituting a movable contact element and a stationary contact element;

each one of said two contact elements possessing a substantially tubular structure;

a blast nozzle having an inlet and being operatively associated in a fixed reference position with respect to one of said two contact elements;

said blast nozzle defining a narrowest location positioned forwardly of said one contact element;

said narrowest location of said blast nozzle being closed by the other one of said two contact elements in a cut-on position of the gas-blast switch;

means defining a pump space pressurizable during a cut-off stroke of the gas-blast switch;

said inlet of said blast nozzle flow communicating with said pump space;

said means defining said pump space including a cylinder;

a piston through which displaceably extends said one contact element with which said blast nozzle is operatively associated;

said cylinder and said piston bounding said pump space;

each one of said two contact elements possessing a related free end and a related region remote from said free end;

at least one outlet provided at said related region of each one of said two contact elements;

each one of said two contact elements defining a related interior space;

a blow-out space;

each said at least one outlet provided in said related region of

each one of said two contact elements, interconnecting said interior space of its related one of said two contact elements and said blow-out space at least in a cut-off position of the gas-blast switch;

said at least one outlet provided in said region remote from said free end of said one contact element with which said blast nozzle is operatively associated, opening into said pump space in said cut-on position of the gas-blast switch;

said cylinder and said piston defining a pumping stroke during said cut-off stroke of the gas-blast switch;

said at least one outlet provided in said region of said one contact element with which said blast nozzle is operatively associated, being spaced from said free end of said one contact element by a distance which is greater than said pumping stroke such that said at least one outlet enters into flow communication with said blow-out space only close to the end of said cut-off stroke; and

said pump space defining a predetermined volume which in the cut-off position is in the range of about $\frac{1}{8}$ to about $\frac{1}{4}$ the volume of said pump space in the cut-on position.

4,598,189

AUTOMATIC WIRE-THREADING WITH A TUBULAR ELECTRODE IN A TW-E MACHINE

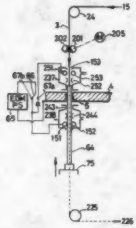
Kiyoshi Inoue, Tokyo; Makoto Onoue, and Sadao Sano, both of Yokohama, all of Japan, assignors to Inoue-Japax Research Incorporated, Kanagawa, Japan

Filed Mar. 5, 1985, Ser. No. 708,226

Claims priority, application Japan, Mar. 28, 1984, 59-58333; Mar. 28, 1984, 59-58334; Apr. 13, 1984, 59-73050; May 2, 1984, 59-87714; May 2, 1984, 59-87715

Int. Cl.[4] B23H *7/02*

U.S. Cl. 219—69 W **54 Claims**



1. A method of threading electrode wire through a conductive workpiece in a traveling-wire electroerosion machine having a cutting zone established in a predetermined continuous path of wire travel between a wire supply means and a wire takeup means, the method comprising the steps of:

(a) positioning a tubular electroerosion electrode axially in alignment substantially with a straight-line wire-threading path extending across a cutting zone in a continuous path;

(b) introducing wire from a supply means into the tubular electroerosion electrode at a wire inlet side of said cutting zone;

(c) positioning the workpiece to locate a start position of traveling-wire electroerosion therein substantially in alignment with said straight-line path in said cutting zone;

(d) axially advancing the tubular electrode substantially along said wire-threading path into and through the workpiece while electroeroding the workpiece to form a bore penetrating the workpiece between said wire-inlet side and a wire-outlet side of said cutting zone at said start position;

(e) retracting the tubular electroerosion electrode substantially along said straight-line path from said workpiece while leaving wire at least partially in said bore finished in the workpiece; and

(f) dispensing electrode wire from said supply means to allow wire to move out of the tubular electrode while at least partially in said bore, into said wire outlet side towards said takeup means in said continuous path.

4,598,190

METHOD AND APPARATUS FOR MACHINING A WORKPIECE IN A TRAVELLING WIRE EDM APPARATUS

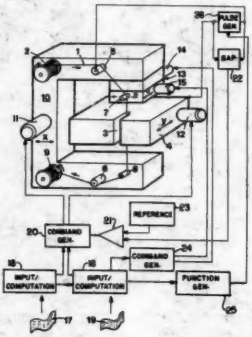
François Balleys, Petit-Lancy, Switzerland, assignor to Charmilles Technologies, S.A., Geneva, Switzerland

Filed Apr. 19, 1983, Ser. No. 486,381

Claims priority, application Switzerland, Apr. 22, 1982, 2435/82

Int. Cl.[4] B23H *1/02, 7/04*

U.S. Cl. 219—69 W **9 Claims**



1. In a method for effecting a cut in a conductive workpiece by electrical discharges of controllable energy by means of an electrode wire in a travelling wire EDM apparatus wherein the electrode wire and the workpiece are displaced relative to each other according to a cutting path of predetermined centerline, the improvement comprising oscillating said electrode wire and said workpiece relative to each other at a predetermined amplitude of oscillation on both sides of said centerline in a direction transverse to the cutting path centerline, monitoring the instantaneous value of the amplitude of each transverse oscillation, and automatically varying the energy of the electrical discharges as an inverse function of the instantaneous value of said amplitude such that rough machining of the cut in the workpiece is effected at a maximum value of said energy corresponding to a minimum instantaneous value of said amplitude and finish machining of at least one lateral wall of said cut in the workpiece is effected at a minimum value of said energy corresponding to a maximum instantaneous value of said amplitude, whereby rough machining of the workpiece and finish machining of at least said lateral wall of the cut in the workpiece are effected in a single pass.

4,598,191

VERY LOW POWER PLASMA ARC CUTTING EQUIPMENT

Gérard Marhic, Cergy, and Francis Remy, Montigny-les-Cormeilles, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation Procedes Georges Claude, Paris, France

Filed Mar. 26, 1985, Ser. No. 716,195

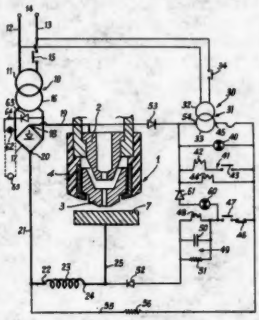
Claims priority, application France, Apr. 4, 1984, 84 05285

Int. Cl.[4] B23K *9/10*

U.S. Cl. 219—121 PW **8 Claims**

1. An installation for controlling the operation of an arc gas welding or cutting torch, comprising an electrode and a nozzle axially movably mounted for movement relative to each other

so as to achieve mutual contact when applied against a work piece in opposition to the action of elastically yieldable means for returning the electrode and nozzle to a mutual position in which the electrode and nozzle are spaced a maximum distance apart corresponding to normal operation of the torch, a welding or cutting electric current source, a welding or cutting current circuit connecting said source between the electrode and the work piece to be welded or cut, an arc gas source connected to the torch for supplying arc gas to the torch, said



installation further comprising an auxiliary control circuit including a safety low voltage auxiliary source connected between the electrode and the work piece, an electric first means for causing the closure of a switch of the welding or cutting current circuit, which first means is adapted to come into action when there is a mutual contact between the electrode, nozzle and work piece, and second means acting in exclusive dependence on the welding or cutting current for maintaining said first means active.

4,598,192

ELECTRICALLY HEATED HANDLE FOR FISHING RODS

John E. Garrett, 805 N. Summerfield Dr., Madison, Tenn. 37115

Continuation-in-part of Ser. No. 585,839, Mar. 2, 1984, abandoned. This application Jun. 28, 1985, Ser. No. 750,233

Int. Cl.[4] H05B *3/00;* **A01K** *87/00, 97/00*

U.S. Cl. 219—201 **3 Claims**

1. An electrically heated handle for a fishing rod having a butt end, comprising:

(a) an elongated hollow handle member having a front end portion and a rear end portion and having a thermally conductive shell enclosing an interior chamber,

(b) an elongated heating core having opposite front and rear ends within said chamber,

(c) said heating core comprising an elongated solid insulator body having an outer surface,

(d) said heating core further comprising an elongated electrically conductive heating coil extending longitudinally through, and in heat conductive contact with, the interior of said insulator body,

(e) said entire outer surface of said insulator body being in heat transfer engagement with said shell,

(f) said front end portion of said hollow handle member comprising an elongated socket chamber spaced in front of, and coaxially of, said interior chamber and having an open front end, said socket chamber being adapted to receive and fit over the butt end of a fishing rod,

(g) an electrical voltage source, external to said hollow handle member for supplying current to said heating coil,

(h) switch means for controlling the supply of current to said heating coil,

(i) an electrical conductor within said interior chamber connecting said heating coil and said switch means, and

(j) an electrical supply conductor connecting said switch means to said voltage source.

4,598,193

APPARATUS FOR HEATING SHOE PARTS

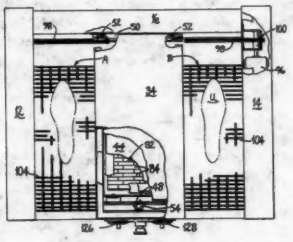
Raymond Hanson, Rearsby, England, assignor to USM Corporation, Farmington, Conn.

Filed May 31, 1984, Ser. No. 615,921

Claims priority, application United Kingdom, Jun. 29, 1983, 8317647

Int. Cl.[4] H05B *3/06;* **A45D** *95/12*

U.S. Cl. 219—215 **6 Claims**



1. A shoe machine for heating a shoe part comprising:

housing means defining a chamber,

shroud means located within said chamber and defining first and second operating zones on either side thereof,

heating means,

means for supporting said heating means for movement from a first operating position within said first operating zone, to a park position within said shroud means and to a second operating position within said second operating zone,

means for displacing said heating means between said first operating position and said park position and between said second operating position and said park position, said displacing means including

first means including a first timer for initiating displacement of said heating means from said park position to said first operating position following a predetermined time delay,

second means including a second timer for initiating displacement of said heating means from said first operating position to said park position following a predetermined time delay,

third means including said first timer for initiating displacement of said heating means from said park position to said second operating position following a predetermined time delay, and

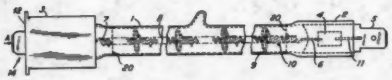
fourth means including said second timer for initiating displacement of said heating means from said second operating position to said park position following a predetermined time delay, and

shoe part support means located within said first and second operating zones.

4,598,194
QUARTZ INFRA-RED LAMPS

Alex L. Halberstadt, London, and John A. Letchford, Enfield, both of England, assignors to Thorn EMI plc, London, England

Continuation of Ser. No. 592,850, Mar. 23, 1984, abandoned.
This application Jul. 15, 1985, Ser. No. 754,689
Claims priority, application United Kingdom, Mar. 24, 1983, 8308103
Int. Cl.[4] H05B 3/68
U.S. Cl. 219—464 5 Claims



1. An infra-red lamp assembly, suitable for use in a domestic cooking hob, including a generally linear filament supported within a tubular envelope of high silica content glass, each end of said envelope comprising: a pinch seal having sealed therein electrical connection means for coupling the respective end of said filament to an electrical power supply, said connection means including an electrical connector emergent externally from said pinch seal; a one-piece moulded housing of heat-resistant material substantially enclosing said pinch seal along substantially the entire length of the seal to protect the seal from heat emitted by the filament, said pinch seal being fixedly secured in said housing by heat-resistant bonding material, and said housing having an essentially rectangular exterior configuration to assist in location of the lamp assembly in an operating environment; and an internal aperture extending axially through said housing and through which connection of said electrical connection means to said power supply is implemented, said internal aperture being of essentially rectangular configuration adjacent at least one end of said housing for initially receiving said pinch seal therein in loose-fitting relationship, said electrical connection means extending axially through said internal aperture, said electrical connector being located adjacent an opposite end of said housing, and said connector and said internal aperture of said housing defining a space in said housing for receiving a female connector to be pushed onto said connector.

4,598,195
SAFETY TEMPERATURE CIRCUIT INCLUDING ZERO CROSSING DETECTOR

Katsuharu Matsuo, Aichi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 508,237, Jun. 27, 1983, abandoned.
This application May 1, 1985, Ser. No. 728,460
Claims priority, application Japan, Jul. 2, 1982, 57-115896; Jul. 14, 1982, 57-123414; Jul. 14, 1982, 57-123415; Sep. 22, 1982, 57-145370[U]
Int. Cl.[4] H03B 1/02
U.S. Cl. 219—497 10 Claims

1. A temperature control apparatus for electric heating equipment powered by an AC power source, comprising:

switching means for selectively applying AC power from the source to the electric heating equipment;

thermal information output means for detecting the temperature of the electric heating equipment supplied with power from the AC power source and for providing thermal information representing the temperature detected;

zero crossing detector means for detecting zero crossings of the AC power source;

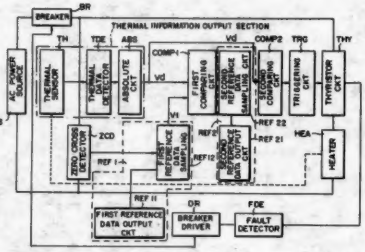
reference data output means for providing first reference data representing a low reference temperature and second reference data representing a high reference temperature;

pulsing means for comparing said thermal information with said first reference data and generating a first pulse signal in synchronism with said zero crossings of said AC power source;

pulse signal output means for comparing said thermal information with said second reference data and generating a second pulse signal; and

triggering means, connected to said pulse signal output means for triggering said switching means according to the second pulse signal from said pulse signal output means;

wherein said reference data output means includes first reference data sampling means for sampling first reference data in synchronism with the zero crossings of said AC power source and second reference data sampling means



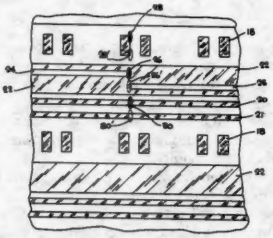
for sampling second reference data in synchronism with the zero crossings of said AC power source, and

said pulse signal output means comprises first comparing means connected to said thermal information output means and the first reference data output means for comparing the thermal information with the first reference data sampled by said first sampling means, to thereby generate a first comparison signal as the second reference data and second comparing means connected to the first comparing means and said thermal information output means for comparing the second reference data sampled by said second sampling means with the thermal information to thereby generate a second comparison signal as the second pulse signal.

4,598,196
DEBIT CARD

Gerald A. Pierce, Redwood City, and Gregory K. Myers, San Francisco, both of Calif., assignors to Drexler Technology Corporation, Mountain View, Calif.

Filed Jul. 10, 1984, Ser. No. 629,368
Int. Cl.[4] G06K 7/10
U.S. Cl. 235—454 12 Claims



1. A consumable debit card comprising,

a support layer,

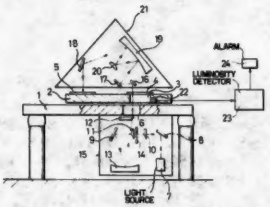
an optically recordable material adhered to said support layer, said material having preformatted optically detectable calibration marks and servo tracks and having an

elongated optically recordable value site area proximate to said calibration marks and servo tracks, said calibration marks lying in a track parallel to said servo tracks and value site area, said calibration mark track and servo track and value site area in parallel alignment, the value site area having a width sufficient for optically decrementing two value site tracks in said value site area by following said servo tracks and calibration marks.

4,598,197
PROJECTION ALIGNER

Koyo Morita, Higashimurayama; Keizo Nomura, Higashiyamato; Hiroshi Nishizuka, Higashikurume; Tai Hoshi, Koganei; Yoichiro Tamiya, Higashimurayama, and Terushige Asakawa, Koganei, all of Japan, assignors to Hitachi, Ltd. and Hitachi Ome Electronic Co., Ltd., both of Tokyo, Japan

Filed Aug. 2, 1983, Ser. No. 519,675
Claims priority, application Japan, Aug. 9, 1982, 57-137269
Int. Cl.⁴ G03B *27/74, 27/80*
U.S. Cl. 250—205 **16 Claims**



1. A projection aligner wherein light from a light source is passed through a mask so as to focus an image of a pattern of the mask on a wafer, characterized in that at least one sensor for monitoring a luminosity distribution thereof is disposed in an optical path between said light source and said mask, and wherein said at least one sensor monitors the luminosity distribution of the light to be passed through said mask at points corresponding to the surface of said wafer, said at least one sensor being disposed proximate to said mask and being movable from a first position adjacent the optical path between said light source and said mask when an image of a pattern of said mask is focused on said wafer to a second position within the optical path between said light source and said mask, said at least one sensor monitoring the luminosity distribution of the light in said second position.

4,598,198
AUTOMATIC POWER CONTROL FOR MODULATED LED PHOTOELECTRIC DEVICES

Robert W. Fayfield, Excelsior, Minn., assignor to Banner Engineering Corp., Minneapolis, Minn.

Filed May 21, 1984, Ser. No. 612,664
Int. Cl.⁴ G01J *1/32;* H01J *40/14;* H05B *37/02*
U.S. Cl. 250—205 **8 Claims**

1. A modulated light source for a photoelectric control, comprising:

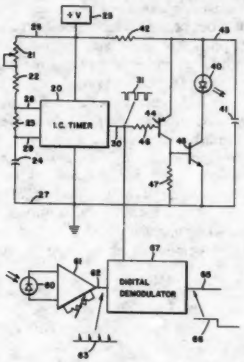
means for providing a variable frequency, variable duty cycle pulsed modulating signal;

a light emitting diode;

a power source for supplying electrical energy to said light emitting diode;

means operatively connected for selectively causing said light emitting diode to conduct current from said power source in response to said pulsed modulating signal; and

means for providing electrical energy to said power source at a controlled rate such that the power supplied to said light emitting diode from said power source on each pulse varies approximately inversely with changes in the duty cycle of the pulsed modulating signal, thereby maintaining

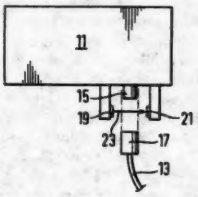


the average power of the light emitting diode relatively constant.

4,598,199
SAFETY DEVICE FOR CONTROLLING A LIGHT SIGNAL GENERATOR BASED ON FIBER POSITION

Christian Hentschel, Holzgerlingen, and Wolfgang Schmid, Stuttgart, both of Fed. Rep. of Germany, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 3, 1983, Ser. No. 549,362
Int. Cl.⁴ G01V *9/04*
U.S. Cl. 250—222.1 **4 Claims**



1. A safety device for a light signal generator which emits light signals to an optical fiber, the safety device comprising:

light emitting means coupled to the light signal generator, for emitting light; and

photodetecting means coupled to the light signal generator for detecting light from the light emitting means, wherein the photodetector means provides a control signal to the light signal generator when the optical fiber is coupled to the light signals generator, and wherein the light signal generator is activated to emit light only when the photodetector means provides the control signal.

4,598,200
RADIATION IMAGE READ-OUT APPARATUS

Yutaka Taniguchi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 29, 1984, Ser. No. 626,001
Claims priority, application Japan, Jul. 4, 1983, 58-121324
Int. Cl.⁴ G03C *5/16*
U.S. Cl. 250—327.2 **10 Claims**

1. A radiation image read-out apparatus including

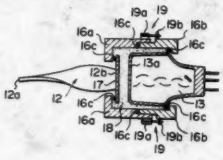
(i) a scanning means for scanning a stimulable phosphor sheet carrying a radiation image stored therein with stimu-

lating rays which cause said stimulable phosphor sheet to emit light in proportion to the radiation energy stored,

(ii) a photodetector for detecting the light emitted from said stimulable phosphor sheet, and

(iii) a light transferring means having one end face constituting a light input face positioned close to a scan line on said stimulable phosphor sheet, and another face constituting a light output face formed to a shape matching the shape of a light receiving face of said photodetector and positioned close to said light receiving face, said light transferring means being fabricated of a light guiding sheet-like material exhibiting a refractive index approximately equal to that of said light receiving face and being positioned between said photodetector and said stimulable phosphor sheet, whereby the light emitted from said stimulable phosphor sheet is detected by said photodetector via said light transferring means,

wherein the improvement comprises the provision of



(iv) a plate-like member closely contacted with said light output face of said light transferring means and exhibiting a refractive index approximately equal to that of said light guiding sheet-like material,

(v) a first covering member closely contacted with said plate-like member, and

(vi) a second covering member closely contacted with the circumferential surface of said photodetector for maintaining said light receiving face of said photodetector at a position standing face to face with said plate-like member in spaced relation, said second covering member being removably joined with said first covering member in liquidtight condition,

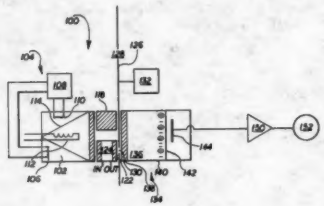
(vii) the space between said light receiving face of said photodetector and said plate-like member being filled in hermetically sealed condition with a transparent liquid exhibiting a refractive index approximately equal to that of said plate-like member.

4,598,201

INFRARED FLUID ANALYZER EMPLOYING A PNEUMATIC DETECTOR

Glenn H. Fertig, Natrona Heights, and Robert J. Wozniak, Belle Vernon, both of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Aug. 9, 1984, Ser. No. 638,995
Int. Cl.[4] G01N *21/37*
U.S. Cl. 250—343 **16 Claims**



1. An infrared fluid analyzer comprising

a. source means for producing a beam of infrared radiation;

b. a sample cell in which fluid to be analyzed is contained, said sample being positioned in said beam of radiation;

c. pneumatic detector means positioned to receive infrared radiation after passage through said sample cell, said detector consisting of

i. a fluid chamber having a fluid responsive to changes in infrared radiation;

ii. a diaphragm in communication with said fluid to move in response thereto;

iii. stator means having one face spaced from and electrically connected to a second face on said diaphragm;

iv. an electret material polarizer wherein the material forms at least a portion of the opposing faces of the diaphragm or stator means; and

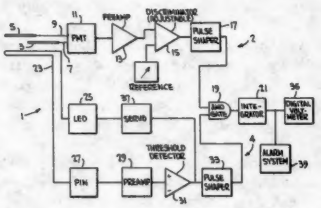
d. means for interrupting said beam from reaching said pneumatic detector.

4,598,202

NUCLEAR AND PRESSURE SENSITIVE LINE/PERIMETER DETECTION SYSTEM

Walter Koechner, 1054 Harriman St., Great Falls, Va. 22066

Filed May 30, 1984, Ser. No. 615,336
Int. Cl.[4] G01T *1/20*
U.S. Cl. 250—366 **12 Claims**



1. A nuclear radiation and pressure sensitive line/perimeter detection system, comprising:

a radiation sensitive circuit comprising: at least one nuclear-radiation sensitive fiber for producing scintillating photons in the presence of nuclear radiation; said fiber comprising an organic scintillator embedded in a polymer forming an elongated cable; at least one light-transmitting optical fiber optically connected to said radiation sensitive fiber for propagation of said photons; detector means connected to said optical fiber and comprising a photomultiplier means for receiving said photons; electronic means operatively associated with said radiation sensitive fiber for receiving signals generated thereby;

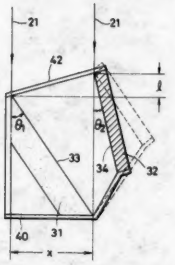
a pressure sensitive circuit comprising: a pressure sensitive fiber, in the form of an elongated cable, operatively associated with said radiation sensitive fiber for detecting pressure; said electronic means being operatively associated with said pressure sensitive fiber for receiving signals generated thereby; a read-out device electrically connected to said electronic means, said electronic means including logic means comprising an AND gate for transmitting a signal from said radiation sensitive circuit to said read-out device only if a signal from said pressure sensitive circuit is present at said AND gate.

4,598,203

MULTIELEMENT RADIATION DETECTOR

Keiji Umetani, Kokubunji; Atsushi Suzuki, Higashiyamato; Manabu Nakagawa, Sagamiko; Minoru Yoshida, Hinode; Fumio Kawaguchi, Hachiouji; Hiromichi Yamada, Hino, and Kouichi Koike, Kashiwa, all of Japan, assignors to Hitachi, Ltd. and Hitachi Medical Corporation, both of Tokyo, Japan

Filed Oct. 23, 1984, Ser. No. 663,945
Claims priority, application Japan, Oct. 24, 1983, 58-198751
Int. Cl.[4] G01T *1/20, 1/16*
U.S. Cl. 250—366 8 Claims



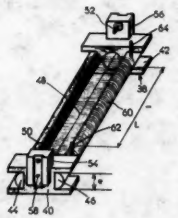
1. A multielement radiation detector comprising a plurality of elements that are isolated from each other by collimators and that are arranged in array, wherein each of the elements includes a scintillator having a plane of incidence tilted with respect to the direction of the incident radiant rays, the plane of incidence having one side on which the radiant rays are incident and through which scintillated lights are radiated and a light detector having a light-receiving plane which is disposed at a position to oppose to said one side of the plane of incidence of said scintillator, the light-receiving plane being tilted with respect to the direction of the incident radiant rays.

4,598,204

DETECTOR FOR LOCALIZING AN ELECTROMAGNETIC RADIATION AND A DEVICE FOR PROCESSING SIGNALS SUPPLIED BY SAID DETECTOR

Serge M. Bras, 19, rue du Picure, 91330 Yerres, France

Continuation of Ser. No. 456,110, Jan. 6, 1983, abandoned. This application Mar. 25, 1985, Ser. No. 715,948
Claims priority, application France, Jan. 25, 1982, 82 01092
Int. Cl.[4] G01T *1/185*
U.S. Cl. 250—374 13 Claims



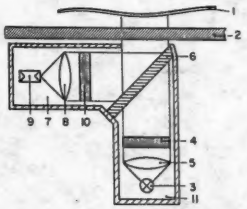
1. An electromagnetic radiation localizing detector of the type comprising at least one anode wire and a cathode of appropriate shape, both disposed in a gas atmosphere which forms the radiation detecting element, characterized in that the cathode is formed of electrical resistance wire bent in a sequence of turns extending transversely of the anode wire thereby forming a coil which surrounds at least partially the anode wire, the detector including a screen having distributed capacitance with the turns of the cathode resistance wire, the distributed resistance and capacitance of the cathode introducing a change in the rise time of the waveform of a radiation signal received thereby dependent on the distance between the locus of reception of such signal and a terminal of the cathode.

4,598,205

SECURITY PAPER WITH AUTHENTICITY FEATURES IN THE FORM OF SUBSTANCES LUMINESCING ONLY IN THE INVISIBLE REGION OF THE OPTICAL SPECTRUM AND PROCESS FOR TESTING THE SAME

Wittich Kaule, Gauting, and Gerhard Stenzel, Munich, both of Fed. Rep. of Germany, assignors to GAO Gesellschaft für Automation und Organisation mbH, Fed. Rep. of Germany

Division of Ser. No. 314,842, filed as PCT DE81/00081 on May 29, 1981, published as WO81/03510 Dec. 10, 1981
Pat. No. 4,451521. Oct. 23, 1981, Pat. No. 4,451,521.
This application Mar. 7, 1984, Ser. No. 586,963
Claims priority, application Fed. Rep. of Germany, May 30, 1980, 3020599
Int. Cl.[4] F21V *9/16;* G01N *21/64*
U.S. Cl. 250—458.1 17 Claims



1. A process for testing the authenticity of security documents secured with a luminescing substance without attracting attention, comprising:

exciting the security document with light from the invisible region of the optical spectrum; and

sensing luminescence light emitted from said security document in the invisible region of the optical spectrum;

wherein the exciting and sensing steps are performed through a plate which is separate from said security document and opaque to visible light but which allows both excitation light and also luminescence light to pass through; and

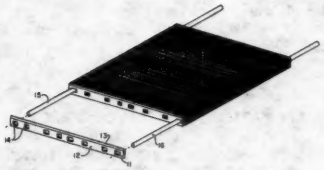
wherein said exciting step is carried out by an exposure unit and said sensing step is carried out by a sensing unit and further including positioning said exposure unit and said sensing unit behind said plate so as to hide said exposure unit and said sensing unit from view.

4,598,206

INFRARED RADIATION REFERENCE

Robert E. Nelson, Weston, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Jul. 6, 1983, Ser. No. 511,315
Int. Cl.[4] G01J *1/00*
U.S. Cl. 250—495.1 22 Claims



1. An infrared radiation reference comprising:

a plurality of nestable, thin, individual members formed from a high thermally stable material, each of said members including a generally symmetrical, triangular edge, said member forming a parallel array of triangular edges when

nested, said edges having highly emissive surfaces with predictable properties;

means for maintaining said members in a close abutting relationship such that the region between the adjacent members approaches a parallel wall slot of small width thereby forming a light trap;

means for controlling the temperature of said members; and

means for sensing the temperature of said members.

4,598,207

STORAGE AND RECONSTRUCTION APPARATUS FOR RADIATION IMAGE

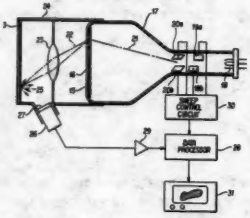
Yujiro Naruse, Yokohama, and Shunji Shirouzu, Ayasa, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 25, 1983, Ser. No. 526,465

Claims priority, application Japan, Aug. 25, 1982, 57-147057; Dec. 9, 1982, 57-214612

Int. Cl.⁴ H05B *33/00*

U.S. Cl. 250—484.1 **14 Claims**



8. A storage and reconstruction apparatus for a radiation image comprising:

an object to be radiated;

a radiation source;

a radiation image storage medium for forming active sites corresponding to a radiation image obtained by irradiation from said radiation source through said object;

a cathode ray tube;

a phosphor film being arranged at the rear of said radiation image storage medium and being formed inside of a face plate of said cathode ray tube;

a light focusing means being arranged between said radiation image storage medium and said phosphor film to focus the light emitted from said phosphor film according to the electron beam scanning in said cathode ray tube and to project the focused light beam into said radiation image storage medium;

a light detecting means for detecting the light emitted from said radiation image storage medium and generating an electrical output signal;

an optical filter being arranged in front of said light detecting means to pass only the light emitted from said radiation image storage medium; and

an image processing means for processing said output signal generated from said light detecting means to reconstruct said radiation image.

4,598,208

COLLIMATION SYSTEM FOR ELECTRON ARC THERAPY

Richard J. Brunelli, and James C. Carter, Jr., both of San Jose, Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 659,876, Oct. 15, 1984, abandoned, which is a continuation of Ser. No. 432,606, Oct. 4, 1982, abandoned. This application Jun. 10, 1985, Ser. No. 742,652

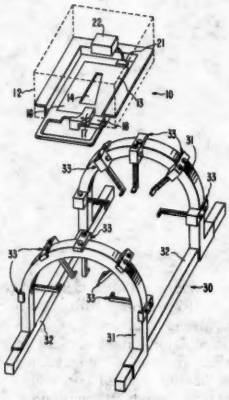
Int. Cl.⁴ G21C *11/00*

U.S. Cl. 250—515.1 **3 Claims**

1. Apparatus for holding shields in fixed position adjacent a patient positioned on a treatment table for treatment by a radiation therapy beam, said holding apparatus comprising:

two substantially semicircular hoops, each of said hoops having at each of its ends support means for positioning the hoops on guide rails such that the hoops face each other and are adjustable toward and away from each other;

a plurality of mounting blocks adjustably positionable along each of said hoops;



a shaft supported by each said mounting block for adjustable positioning toward and away from the central portion of the hoop with which the respective mounting block is associated; and

each said shaft having a rest surface facing outwardly toward its respective block, whereby selective movement of said blocks along said hoops and selective movement of said shafts relative to said blocks enables positioning of said rest surfaces in a variety of different arrangements so as to permit supporting on said rest surfaces variously shaped shields.

4,598,209

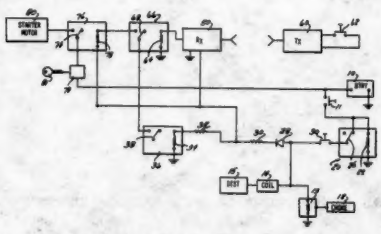
REMOTE CONTROL ENGINE STARTER

Randy Garlinghouse, 4178 Oakshire, Berkley, Mich. 48072

Filed Oct. 9, 1984, Ser. No. 659,092

Int. Cl.⁴ F02N *17/00*

U.S. Cl. 290—38 C **5 Claims**



1. A remote control engine starter for use in remotely starting an engine including a starter motor and a battery, comprising:

transmitter means, remote from the engine, for transmitting a signal;

timer means for generating an output at a pre-determined time;

switch means for connecting the timer means to the engine battery; and

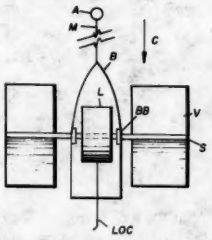
receiver means, responsive to the timer means, for detecting a signal from the transmitter means and energizing the starter motor of the engine only when an output from the timer means has been generated.

4,598,210

WATER CURRENT MOTOR

Lloyd I. Biscomb, 4452 Burlington Pl., NW., Washington, D.C. 20016

Filed May 11, 1984, Ser. No. 609,318
Int. Cl.[4] F03B 7/00
U.S. Cl. 290—43 11 Claims



1. A water current motor, comprising:

a hull constructed and arranged to float on the surface of a body of water which has a current;

an anchor constructed and arranged to be fixed at a desired location;

a mooring line constructed and arranged to tether the floating hull to the fixed anchor, so that the hull trails in the current from the anchor;

a load constructed and arranged to convert a rotary input into a useful output, said load including a rotary input shaft means which projects generally horizontally in opposite directions therefrom, said load further including a load output conduit constructed and arranged for conducting said useful output from said load;

said load being disposed on said hull so that said shaft means, on both sides of said hull projects transversely outboard of said hull near said water surface;

two similar and balanced sets of vanes arranged in respective wheels and secured on said shaft means, outboard of said hull, respectively on opposite sides of said load;

each set of vanes comprising at least three equi-angularly spaced vanes constructed and arranged to sequentially dip below the surface of the water, be pushed downstream by force of the water current thereagainst, to clear the surface of the water and return upstream in the air above the surface of the water, thereby rotating said shaft and operating said load to produce said load output;

a floating fender constructed and arranged to float on the surface of said body of water upstream of said hull; and

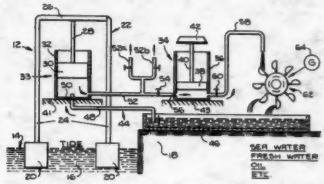
means mounting the floating fender with respect to the hull and with respect to the mooring line and being constructed and arranged to deploy the floating fender so widely but so shallowly that the floating fender effectively prevents floating debris from impacting said hull and said vanes, while not appreciably deflecting water current from forcibly acting on said vanes to turn said shaft.

4,598,211

TIDAL ENERGY SYSTEM

John Koruthu, P.O. Box 5228, Safat, Kuwait

Filed Jan. 16, 1984, Ser. No. 571,108
Int. Cl.[4] F03B 13/12
U.S. Cl. 290—53 6 Claims



1. Tidal apparatus for producing energy by means of rising and ebbing sea tides, comprising,

(A) a first main component,

(B) a second main component,

(C) linkage operably interconnecting the two main components,

A. said first main component including a float/weight in the sea, of indeterminate maximum dimensions, of a density less, but only slightly less, than the sea water, so as to float therein and of maximum weight/volume ratio, and being contained only by the sea water and supported only by flotation by the sea water, and being movable into and out of an operable position adjacent to an operating position on the land, the float/weight being movable bodily as a whole in vertical directions in direct response to the tidal movements in proportion to its own dimensions,

B. said second main component being mounted on and supported by the land in said operating position, and independently of the sea water, and having at least a portion located above the first main component, for operating cooperation between the two main components,

said second main component including,

1. a power unit including a vertical cylinder and piston and being located in said portion located above the first main component,

2. a storage unit,

3. a conduit system operative for conducting fluid from a source to the power unit and from the power unit to the storage unit in response to operation of the power unit,

4. an operating unit, and

5. the storage unit being capable of moving fluid therein to the operating unit for operating the latter,

C. said linkage being interconnected between the float/weight and the piston in the power unit, whereby to operate the power unit in response to vertical movements of the float/weight.

4,598,212

DRIVER CIRCUIT

Robert L. Spiesman, Phoenix, Ariz., assignor to Honeywell, Inc., Phoenix, Ariz.

Filed Dec. 17, 1984, Ser. No. 682,522
Int. Cl.[4] H02J 3/02
U.S. Cl. 307—3 5 Claims

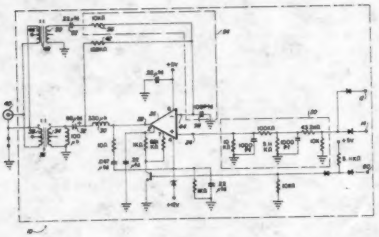
1. A driver circuit for applying a quasi-sinusoidal signal having a given peak to peak voltage and frequency to a transmission line comprising:

a driver transformer having a primary winding and a secondary winding;

amplifying means having inverting and noninverting input terminals to which said quasi-sinusoidal signal is applied for producing an output signal at an output terminal of the amplifying means, which output signal is applied across the primary winding of the driver transformer;

a feedback transformer having a primary and a secondary winding;

circuit means for connecting the secondary winding of a driver transformer in parallel with the primary winding of the feedback transformer and for applying signals induced in the secondary winding of the driver transformer to the transmission line; and



feedback means for applying signals induced across the secondary winding of the feedback transformer to the inverting input terminal of the amplifying means, whereby the signal applied to the transmission line from the secondary winding of the driver transformer substantially match the signals applied to the noninverting input terminal of the amplifying means.

4,598,213

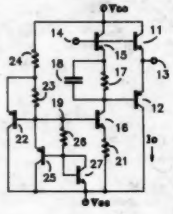
BIPOLAR TRANSIENT DRIVER

Robert R. Marley, and Mark S. Birrittella, both of Phoenix, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 24, 1984, Ser. No. 653,613

Int. Cl.[4] H03K *17/60, 17/68, 17/04*

U.S. Cl. 307—270 **5 Claims**



1. A circuit comprising:

a first voltage terminal;

a second voltage terminal;

first means for receiving an input signal having a high state and a low state;

a pair of push pull transistors comprising a first PNP transistor and a first NPN transistor, said first NPN transistor having a base coupled to said first means and a collector coupled to said first voltage terminal, said first PNP transistor having a collector coupled to said second voltage terminal;

an output terminal coupled to the emitters of said first NPN transistor and said first PNP transistor wherein a capacitive load is quickly charged when said input signal is in said high state and is quickly discharged when said input signal is in said low state;

a second NPN transistor having a base coupled to said first means and a collector coupled to said first voltage terminal;

second means for providing a resistance coupled between an emitter of said second NPN transistor and a base of said first PNP transistor;

a third NPN transistor having a collector coupled to said base of said first PNP transistor;

third means for providing a resistance coupled between an emitter of said third NPN transistor and said second voltage terminal; and

fourth means coupled between said first and second voltage terminals and coupled to a base of said third NPN transistor for establishing a predetermined current through said third means.

4,598,214

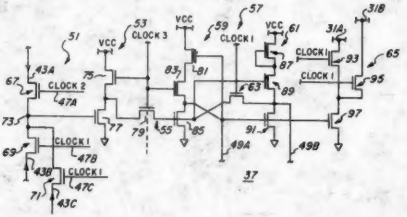
LOW POWER SHIFT REGISTER LATCH

Joe F. Sexton, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 31, 1983, Ser. No. 547,524

Int. Cl.[4] G11C *11/40, 19/28*

U.S. Cl. 307—291 **4 Claims**



1. A logic circuit for a shift register stage comprising:

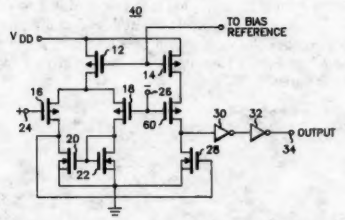
latch means (57) for storing data including (a) first (59) and second (61) field effect device inverters each having an input terminal and an output terminal, said input terminal of said first field effect device inverter being the input terminal of said latch means, said output terminal of said first field effect device inverter connected to said input terminal of said second field effect device inverter, each of said field effect device inverters having an enhancement mode field effect device (85, 91) having a gate connected to said inverter input terminal, a source connected to said inverter output terminal and a drain connected to a reference potential, a first depletion mode field effect device (82, 89) having a gate, said gate of said first depletion mode field effect device (82) of said first field effect inverter receiving an isolation clock signal (clock 3) and said gate of said first depletion mode field effect device (89) of said second field effect inverter being connected to said input of said first field effect device inverter, a drain connected to the source of said first enhancement field effect device and a source for receiving a bias signal, and a second depletion mode field effect device (81, 87) having a gate, said gate of said second depletion mode field effect device (81) of said first field effect inverter being connected to said output of said first field effect inverter and said gate of said second depletion mode field effect device (87) of said second field effect inverter being connected to its drain, a drain connected to the source of said first depletion field effect device and a source for receiving a bias potential, and (b) a controllable feedback circuit means (63) selectively connecting the output terminal of said second field effect device inverter to the input terminal of said first field effect device inverter; and

isolation means (55) connected to said latch means (57) having a isolation clock signal input for connecting an input signal to said input terminal of said latch means when said isolation clock signal is in a first state and for isolating said latch means from said input signal when said isolation clock signal is in a second state.

4,598,215
WIDE COMMON MODE RANGE ANALOG CMOS VOLTAGE COMPARATOR

Melvin A. Schechtman, Schaumburg, and Ronald H. Cieslak, Chicago, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 3, 1983, Ser. No. 548,537
Int. Cl.[4] H03K 5/24
U.S. Cl. 307—355 2 Claims

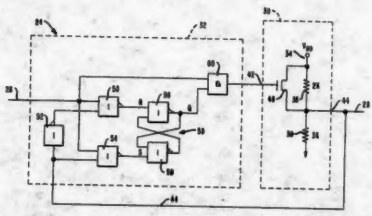


1. An improved differential comparator circuit comprising:
(a) first and second current source means having outputs providing constant sources of current, respectively;
(b) differential input means comprising a first and second differential transistor means having common terminal, said common terminal being coupled to the output of said first current source means, said first and second differential transistor means each having input and output terminals.
(c) current mirror means comprising a first and second current mirror transistor means, each having an input, said first and second mirror transistor means coupled to said output terminals of said first and second differential transistor means, respectively;
(d) output transistor means having an output terminal and further having an input terminal coupled to the output terminal of said first differential transistor means and the input terminal of said first current mirror transistor means; and
(e) output buffer transistor means coupled between the output of said second current source means and the output terminal of said output transistor means and having an input terminal coupled to the input terminal of said second differential input transistor means.

4,598,216
ASSIST CIRCUIT FOR A DATA BUS IN A DATA PROCESSING SYSTEM

Donald K. Lauffer, Poway; Paul M. Rostek, San Diego, and Mehdi H. Sani, La Jolla, all of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Aug. 27, 1984, Ser. No. 644,407
Int. Cl.[4] H03K 17/04, 19/096
U.S. Cl. 307—443 5 Claims

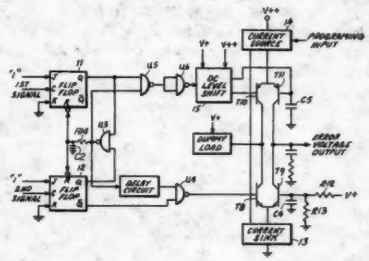


1. In a circuit for assisting transitions of a signal on a bus conductor, the improvement com- prising;
sensing means connected to the bus conductor for determining if said bus conductor is in a first state or a second state;
assist means for assisting transitions of a signal on said bus conductor between said first state and said second state responsive to electrical clock pulses; and
logic means connected to said sensing means and said assist means for enabling said assist means when said signal transition of said signal is from said first state to said second state during said clock pulses, and for disabling said assist means when said signal transition is from said second state to said first state during said clock pulses.

4,598,217
HIGH SPEED PHASE/FREQUENCY DETECTOR

Joseph P. Predina, and Tim H. Roberts, both of Fort Wayne, Ind., assignors to ITT Corporation, New York, N.Y.

Filed Mar. 19, 1984, Ser. No. 591,281
Int. Cl.[4] H03K 9/06
U.S. Cl. 307—525 26 Claims

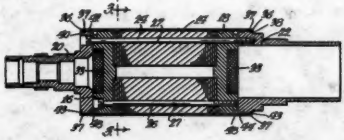


1. A phase/frequency detector to detect the phase/frequency difference between two signals comprising:
first bistable means clocked by one of said two signals to produce a first output pulse;
second bistable means clocked by the other of said two signals to produce a second output pulse;
gate means coupled to said first and second bistable means responsive to said first and second output pulses to produce a reset pulse to reset said first and second bistable means after a first predetermined time delay;
first means coupled to said first bistable means and said gate means to reduce the width of said first output pulse; and,
second means coupled to said second bistable means and said gate means to reduce the width of and invert said second output pulse, said second means including
third means to equalize turn on and turn off times of said reduced width first output pulse and said reduced width second output pulse.

4,598,218
HIGH SPEED ROTOR WITH REMOVABLE CAN

Mohd A. Aleem, Roscoe; James L. Lobsinger, and Jerry D. Wefel, both of Rockford, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Division of Ser. No. 523,923, Aug. 17, 1983, Pat. No. 4,510,679.
This application Nov. 30, 1984, Ser. No. 677,673
Int. Cl.[4] H02K 15/00
U.S. Cl. 310—42 5 Claims



1. In a rotor of the type having a core subassembly having

opposed ends, an outer peripheral surface and a rotational axis and a cylindrical can having inner and outer surfaces, said inner surface disposed closely over and fixed to the outer surface of the core subassembly, the improvement comprising:

a plurality of annular reliefs in the outer peripheral surface of the core subassembly; and

a plurality of axially extending reliefs in the outer surface of the core subassembly and each intersecting both of the annular reliefs,

said reliefs permitting cutting of the can completely through the can over the reliefs without damaging the core subassembly;

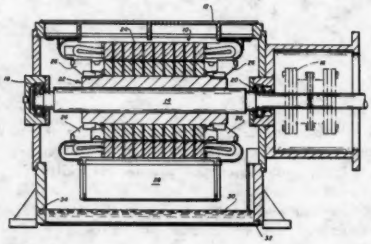
whereby with the can cut over the reliefs said can can be separated from the core subassembly to expose the core subassembly for refurbishment thereof.

4,598,219

SUBMERSIBLE MOTOR

F. David Gaylord, Hales Corners, and Jack C. Wickersheimer, West Allis, both of Wis., assignors to MagneTek, Inc., Milwaukee, Wis.

Filed Oct. 19, 1979, Ser. No. 86,325
Int. Cl.[4] H02K *5/10*
U.S. Cl. 310—87 **3 Claims**



1. A motor assembly adapted for submersion into an environmental liquid comprising:

a motor;

a housing encompassing the motor and including sealing means for substantially preventing the leakage of environmental liquid into the housing;

first conduit means for permitting into ingress of gas into the housing and having a first end positioned above the liquid surface;

second conduit means communicating with the housing interior and positioned to discharge gas and accumulated liquid egressing therefrom above the surface of the environmental liquid to provide a visual indication of leakage rate;

a source of compressed gas coupled to the first end of the first conduit means for supplying gas to the housing interior at a pressure which exceeds the ambient pressure at the level of submersion.

4,598,220

END PLAY AND LUBRICATING SYSTEM FOR FRACTIONAL HORSEPOWER ELECTRIC MOTORS

Thomas W. Stone, Owosso, Mich., assignor to Universal Electric Company, Owosso, Mich.

Filed Aug. 15, 1984, Ser. No. 640,979
Int. Cl.[4] H02K *5/16*
U.S. Cl. 310—90 **7 Claims**

1. A fractional horsepower electric motor comprising a stator,

a shell supporting the stator,

end members closing the ends of the shell,

a shaft supporting a rotor within the stator,

a bearing system on the end members rotatably supporting the shaft comprising

a bearing member on said shaft,

said end member having a seat for engagement by said bearing member,

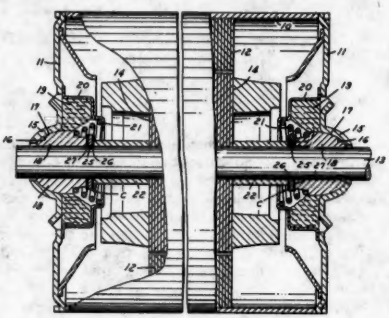
spring means yieldingly urging said bearing member against said seat,

oil retention means associated with the bearing member,

a spacer on said shaft,

and a composite washer interposed between said spacer and said bearing member having an opening through which said shaft extends through which said shaft extends,

said composite washer comprising a base layer of plastic filament material having an opening through which said shaft extends,



a layer of elastic material bonded to one surface of said base layer having an opening through which said shaft extends,

and an oil impregnated layer bonded to the other surface of said base layer and engaging said bearing member having an opening through which said shaft extends, the outer diameter of the base layer being not less than the diameter of the elastic layer and the oil impregnated layer,

the diameter of the opening through the oil impregnated layer being less than the diameters of the opening in said base layer and said elastic layer,

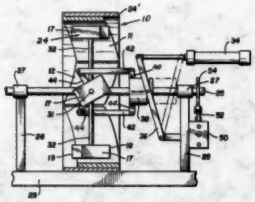
whereby oil from said bearing passes through said base layer in capillary fashion and upon rotation is directed in small droplets toward said oil reservoir.

4,598,221

PERMANENT MAGNET MOTOR HAVING ROCKABLE ROTOR MAGNETS

William J. Lawson, R.D. 1, Box 299E, and Robert J. Lawson, 129 Union St., both of Milton, Del. 19968

Continuation-in-part of Ser. No. 693,900, Jan. 23, 1985. This application Mar. 25, 1985, Ser. No. 715,250
Int. Cl.[4] H02K *49/00*
U.S. Cl. 310—103 **12 Claims**



1. A permanent magnet motion conversion device comprising a ring stator including a plurality of circumferentially

extending and circumferentially spaced stator magnets having exterior and interior faces of opposite magnetic polarities, a like number of circumferentially extending stator magnets intervened circumferentially with the first-named stator magnets and having exterior and interior faces of opposite polarities which are also opposite to the polarities of the first-named stator magnets, at least a rotor permanent magnet adapted to be driven by the stator permanent magnets and having radially disposed side faces of opposite magnetic polarities, the rotor magnet between its side faces extending substantially axially of the stator, at least the first-named stator magnets and the rotor magnet having mutually perpendicular magnetic flux fields of such relative sizes that the flux field of the rotor magnet may enter and be contained wholly within the flux field of each first-named stator magnet during rotor rotation, and means carrying the rotor magnet on its path of rotation and including an associated power mechanism to rotate the rotor magnet around a radial axis in opposite directions as the rotor magnet traverses each stator magnet in succession on its circumferential path of movement relative to the stator.

4,598,222

DIRECT CURRENT MACHINE

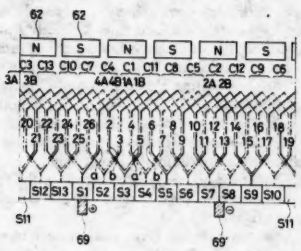
Katsuo Matsunaga, Nitta; Osami Kanbe, and Hiroyuki Otaki, both of Kiryu, all of Japan, assignors to Mitsuba Electric Manufacturing Co., Ltd., Japan

Filed Dec. 4, 1984, Ser. No. 677,837

Claims priority, application Japan, Dec. 20, 1983, 58-195671[U]

Int. Cl.⁴ H02K *3/00*

U.S. Cl. 310—198 **5 Claims**



1. A direct current machine comprising a commutator with a number of commutator segments; a number of field poles; and an armature in which a plurality of coils are opposed to respective field poles and are coil-wound in wave winding with one another, said armature further having a number of slots into which said coils are coil-wound; wherein each coil in said armature is divided into a plural number n of divided coil members coil-wound in series, each coil member having coil sides, the coil sides associated with each coil being disposed in adjacent slots; and wherein the number of slots is n times the number of commutator segments.

4,598,223

END TURN CONSTRUCTION FOR DYNAMOELECTRIC MACHINES

Timothy F. Glennon, and Richard W. Reynolds, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 21, 1984, Ser. No. 685,120

Int. Cl.⁴ H02K *3/46*

U.S. Cl. 310—260 **1 Claim**

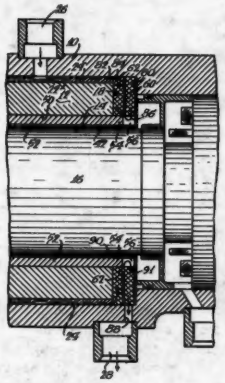
1. A dynamoelectric machine comprising:

a body of magnetizable material having opposed ends, an opening extending between said ends and plurality of slots about the opening;

a rotor within said opening and journalled for rotation therein about an axis;

electrical conductors constituting windings for said machine and located in said slots and extending therefrom just past said ends;

electrical conductive end turns adjacent each of said ends, each interconnecting a predetermined pair of said conductors, said end turns being shaped as a series of stretched, interwoven "Z's" each connected at its respective ends to said electrical an associated one of a corresponding pair of conductors, tops and bases of said Z shaped series defining



closely adjacent, parallel planes transverse to said axis and being concave with respect to said axis;

a radially extending baffle disposed between said tops and said bases; and

means for flowing coolant into said series in a generally radially inward direction on one side of said baffle and in a generally radially outward direction on another side of said baffle.

4,598,224

SURFACE ACOUSTIC WAVE DEVICE FOR SENSING THE PRESENCE OF CHEMICAL AGENTS

Arthur Ballato, Long Branch, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 7, 1985, Ser. No. 763,164

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—313 R **5 Claims**

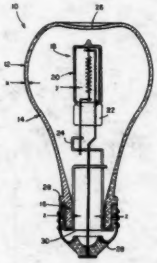
1. A surface acoustic wave device for sensing the presence of chemical agents by chemo-electronic means, said device comprising a quartz substrate, means deposited on the substrate for propagating and receiving surface acoustic waves along the surface of the quartz substrate and regions on said substrate containing etched tunnels coated within the walls of the tunnel with a chemical substance sensitive to the chemical agent to be detected so that when surface acoustic waves are caused to pass over these regions, the reaction of the chemical agent to be detected with the chemical substance causes a change in the acoustic wave velocity.

4,598,225

ELECTRIC LAMP WITH HIGH OUTER-ENVELOPE TO INNER-ENVELOPE WALL-THICKNESS RATIO

Peter R. Gagnon, Georgetown, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Feb. 25, 1983, Ser. No. 469,843
Int. Cl.[4] H01J 5/12; H01K 1/34
U.S. Cl. 313—17 9 Claims



1. An integral double-enveloped tungsten-halogen lamp for general lighting applications comprising:

(a) an outer envelope formed from light-transmissive material, said outer envelope having a body and a neck, said body of said outer envelope having a minimum wall thickness, x;

(b) an inner envelope being a tungsten-halogen light-source capsule, said light-source capsule having a body and at least one end, said body of said light-source capsule having a maximum wall thickness, y, of less than approximately 0.9 millimeters;

(c) mounting means for mounting said light-source capsule within said outer envelope, said mounting means being mounted on said outer envelope;

(d) a base mounted on said neck of said outer envelope, said base having means for receiving electrical power from an external source;

(e) electrical means within said outer envelope for completing an operational electrical circuit between said base and said light-source capsule; and

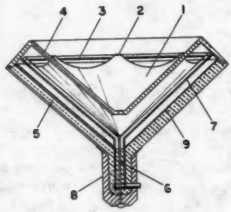
(f) a wall-thickness ratio, x/y, being approximately equal to or greater than 3, whereby said outer envelope is capable of containing a burst of said light-source capsule in the unlikely event said burst should occur.

4,598,226

CONCAVE CONICAL FOIL-FILAMENT LAMP

John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed Dec. 17, 1984, Ser. No. 682,215
Int. Cl.[4] H01J 1/15
U.S. Cl. 313—341 1 Claim



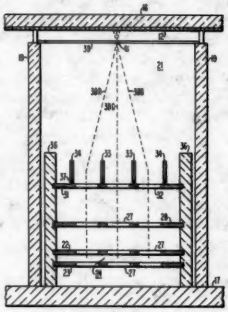
1. A concave conical foil-filament lamp comprising a concave conical foil filament (1) suspended by mounting tabs (2) inside a ring conductor (3) between a concave conical front bulb wall (4) and a concave conical rear bulb wall (5), with a concave conical reflective plate (9) mounted between foil filament (1) and concave conical rear bulb wall (5).

4,598,227

ELECTRON BEAM CONVERGENCE AND SCANNING STRUCTURES FOR FLAT PANEL DISPLAY DEVICE

Thomas L. Credelle, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 26, 1984, Ser. No. 593,093
Int. Cl.[4] H01J 29/08, 29/74
U.S. Cl. 313—422 4 Claims



1. In a flat panel display device having a baseplate and a phosphor screen supported on a faceplate, a plurality of internal support walls dividing said display device into a plurality of longitudinal channels, an electron beam guide assembly in each of said channels for propogating electrons longitudinally along said channels, each of said beam guide assemblies including an acceleration mesh for accelerating electrons toward said screen; said acceleration mesh including a plurality of columns of apertures extending longitudinally along said acceleration mesh; an improvement for converging electrons in the proximity of said screen and for transversely scanning electrons across said channels comprising:

a plurality of conductive strips arranged between and along both sides of each of said columns of apertures, said conduction strips being supported above said acceleration mesh, and between said acceleration mesh and said phosphor screen, the edges of said strips extending longitudinally along and substantially parallel to said acceleration mesh, the planes of said conductive strips extending substantially parallel to one another, and substantially normal to the plane of said acceleration mesh whereby electrons traveling toward said screen pass between said strips, a portion of said strips being voltage biased to converge electrons in the proximity of said screen and said strips being voltage biased to scan said electrons transversely across said channels.

4,598,228

HIGH RESOLUTION OUTPUT STRUCTURE FOR AN IMAGE TUBE WHICH MINIMIZES FRESNEL REFLECTION

Yoshiharu Obata, Yokohama; Takashi Noji, Odawara; Masahiro Sugiyama, and Shigeharu Kawamura, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

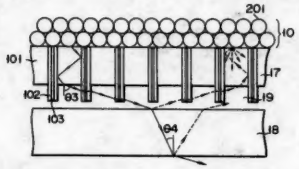
Filed Apr. 26, 1984, Ser. No. 604,117
Claims priority, application Japan, Apr. 28, 1983, 58-75044
Int. Cl.[4] H01J 1/62, 29/18
U.S. Cl. 313—475 17 Claims

1. An output structure for an image tube, comprising:

an optical fiber plate including a plurality of optical fibers, each said fiber including a core and a clad surrounding said core, each said fiber having a first and a second end

surface, one of said end surfaces being formed with a depression of at least 1 μm in said core so that each said clad extends further away from the other end surface than does each said core;

a phosphor layer formed on said first end surface of said optical fiber plate; and



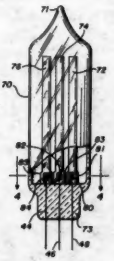
an output window, opposed to said second end surface of said fiber plate, wherein said output window does not extend within said depressions said optical fiber plate reducing the normally expected fresnel reflection.

4,598,229

LUMINOUS TUBE COLOR GENERATOR

Haden V. Henning; Jerry G. Warthan, both of Arlington, Tex., and John Fajt, Norman, Okla., assignors to Lightmasters, Ltd., Dallas, Tex.

Filed Jul. 23, 1984, Ser. No. 633,477
Int. Cl.[4] H01J *1/62, 63/04*
U.S. Cl. 313—493 **5 Claims**



1. A gas-filled luminous tube structure for producing light of variable hue, comprising:

an outer tube sealed at one end to form a base and sealed at the opposite end so as to contain a luminous gas;

three inner tubes mounted inside said outer tube and on said base, said inner tubes extending upward from said base and terminating with open ends inside said outer tube;

an electrode located inside each of said inner tubes at said base end, and a common electrode located inside said outer tube and outside said inner tubes, said electrodes extending outside said outer tube through said base to enable connection to an electric power source;

means associated with each inner tube for producing light having the primary colors of red, green, and blue, such that each of said three inner tubes produces one of said primary colors; and

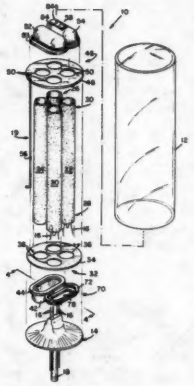
means for controlling the current through each of said inner tube electrodes independently, thereby enabling the structure to produce any color of light which is composed of said primary colors.

4,598,230

COMPACT FLUORESCENT LAMP HAVING THERMALLY ACTUABLE MEANS

Andre C. Bouchard, Peabody, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Mar. 21, 1984, Ser. No. 591,743
Int. Cl.[4] H01J *61/28, 61/34*
U.S. Cl. 313—493 **7 Claims**



1. In a fluorescent lamp having an hermetically sealed outer envelope containing an arc generating and sustaining medium; an assembly positioned within said envelope, said assembly comprising a plurality of elongated glass tubes each hving first and second ends, said tubes being coated on their interior surface with a phosphor, all of said interior surfaces being open to said medium; at least one arc directing means operatively associated with said first ends of said tubes and including an arc director, said arc director forming a part of the arc path through said tubes; an electrode at either end of said arc path, and means for making electrical connection to said electrodes, said arc directing means comprising a relatively thick, rigid, electrically conductive base member having a plurality of apertures therein, some of the apertures including means formed to receive said electrodes and other of said apertures including means formed to receive the first ends of said tubes that do not contain electrodes; said arc director being associated with said other apertures, the improvement comprising: thermally actuable means associated with said assembly operable to open communications with the interior of said tubes upon application of heat thereto; and operable to form an arc tight seal with the interior of the tube upon removal of heat therefrom.

4,598,231

MICROWAVE ION SOURCE

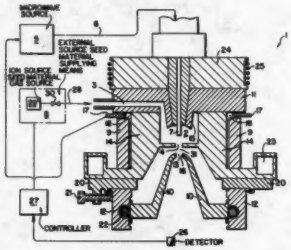
Koji Matsuda, Shiga; Toshinori Takagi, and Junzo Ishikawa, both of Kyoto, all of Japan, assignors to Nissin-High Voltage Co. Ltd., Kyoto, Japan

Filed Feb. 1, 1983, Ser. No. 524,140
Claims priority, application Japan, Nov. 25, 1982, 57-207384
Int. Cl.[4] H01J *7/24;* **H05B** *31/26*
U.S. Cl. 315—111.81 **19 Claims**

1. In a microwave ion source comprising a high voltage discharge chamber having an ion source seed material inlet, an ion outlet, means for radiating microwaves in the discharge chamber, means for applying a magnetic field to the discharge chamber, means for supplying an ion source seed material to the discharge chamber through the ion source seed material inlet, and ion extraction means, the improvement comprising:

said ion extraction means comprising a low voltage ion extraction electrode downstream of the ion outlet of the

discharge chamber, insulating means separating the low voltage ion extraction electrode and the high voltage discharge chamber, said low voltage ion extraction electrode comprising a magnetic material for defining a mag-



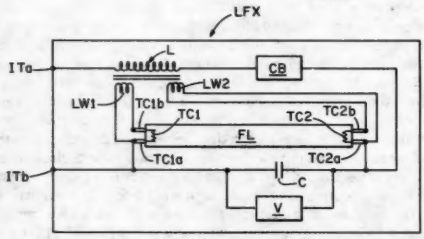
netic field extending in the ion extraction direction from inside said discharge chamber and out through a space defined between said ion outlet and said low voltage ion extraction electrode.

4,598,232

HIGH-FREQUENCY LIGHTING SYSTEM

Ole K. Nilssen, Caesar Dr., Barrington, Ill. 60010

Filed Aug. 25, 1983, Ser. No. 526,389
Int. Cl.[4] H05B *37/02, 39/04, 41/36*
U.S. Cl. 315—225 **10 Claims**



1. A lighting fixture adapted to be powered from a source of AC voltage, said AC voltage being of frequency substantially higher than that of the voltage on an ordinary electric utility power line comprising:

a pair of input terminals operable to connect with said source of AC voltage;

a series-combination of an inductor and a capacitor, said series-combination being: (i) connected in circuit between said pair of input terminals, (ii) substantially resonant at the fundamental frequency of said AC voltage, and (iii) whenever not connected with an adequate load, disposed to draw an excessively large amount of current from said input terminals whenever said AC voltage is present thereacross;

a gas discharge lamp disconnectably connected in circuit either across said capacitor or across said inductor, whereby, whenever connected and in operation, said lamp constitutes an adequate load for said resonant series-combination, thereby preventing said excessively large amount of current from being drawn;

protection means connected in circuit with said resonant series-combination and operative to prevent, whenever said lamp is disconnected or otherwise fails to constitute an adequate load, said excessively large amount of current from being drawn; and

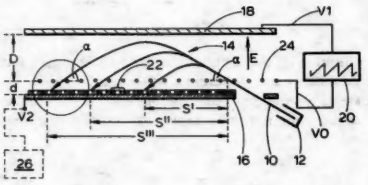
mechanical structure means operative to support and hold together said input terminals, said gas discharge lamp, said series-combination, and said protection means.

4,598,233

COLOR DISPLAY TUBE AND DEVICE HAVING SUCH A TUBE

Pieter Schagen, Redhill, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 18, 1980, Ser. No. 188,406
Claims priority, application United Kingdom, Sep. 21, 1979, 7932745
Int. Cl.[4] H01J *29/70, 29/72*
U.S. Cl. 315—366 **4 Claims**



1. A color display tube comprising:

(a) a target electrode having parallel bands of phosphor lines, the respective lines in each band luminescing in different colors;

(b) spaced-apart electrodes defining a trajectory control space, including:

(1) a planar electrode; and

(2) a mesh electrode positioned adjacent to the target electrode, said mesh electrode comprising parallel conductors having spaces therebetween which correspond with respective bands of the phosphor lines;

(c) means for producing a modulated electron beam and directing it into the trajectory control space;

(d) means for producing a first potential difference, between the mesh electrode and the planar electrode, for directing the electron beam to a designated band of phosphor lines; and

(e) means for producing a second potential difference, between the mesh electrode and the target electrode, for deflecting the electron beam onto a selected phosphor line in the designated band.

4,598,234

DIGITAL IMAGE CORRECTION CIRCUIT FOR CATHODE RAY TUBE DISPLAYS

Barry A. McKibben, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed May 29, 1984, Ser. No. 614,509
Int. Cl.[4] H01J *29/56*
U.S. Cl. 315—370 **17 Claims**

4. A digital electron optics correction circuit for providing image correction signals in a display system having a CRT with a screen and image correction elements, and having horizontal and vertical sweep synchronization circuits for providing horizontal and vertical blanking synchronization signals, the horizontal and vertical blanking synchronization signals being in substantially synchronized relationship and each comprising a sequence of pulses, and the circuit, comprising:

first clock generator means for generating N1 pulses between pulses of the horizontal blanking synchronization signal;

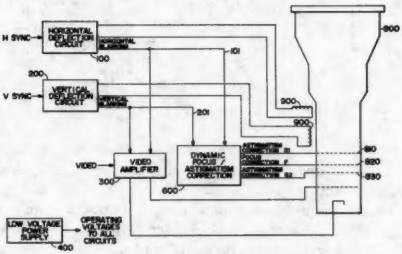
an X-address counter coupled to said first clock generator means for counting said N1 pulses and for providing a first address signal corresponding to a particular horizontal position on said CRT screen for each count of said X-

address counter, said counter being reset on each pulse of the horizontal blanking synchronization signal;

pulse generator means for generating N3 pulses between pulses of the vertical blanking synchronization signal;

a Y-address counter coupled to said pulse generator means for counting output pulses from said pulse generator means and for providing a second address signal corresponding to a particular vertical position on said CRT screen for each count of said Y-address counter; and

image correction means coupled to said X- and Y-address counters for receiving said first and second address signals and for providing image correction signals in response thereto,



and wherein said first clock generator means comprises first clock means having an output terminal for providing a sequence of clock pulses with a frequency f, said first clock means being gated by the horizontal blanking synchronization signal and having a control terminal for receiving a signal that is effective to adjust said frequency f, and feedback means connected between said output terminal and said control terminal and operative to decrease said frequency f if said X-address counter reaches N1 counts before being reset by the horizontal blanking synchronization signal, and to increase said frequency f if said X-address counter does not reach N1 counts before being reset by the horizontal blanking synchronization signal.

4,598,235

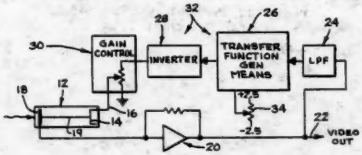
METHOD AND APPARATUS FOR ELIMINATING LAG IN PHOTOELECTRIC TUBES

John O. Ryan, Cupertino, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Mar. 27, 1984, Ser. No. 593,748

Int. Cl.[4] H01J *29/56*

U.S. Cl. 315—370 **5 Claims**



1. A circuit for eliminating lag in a photoelectric tube having a cathode, a target, and an electron beam generated by the cathode for scanning an image on the target and for generating a video output signal, said circuit including a feedback loop for supplying an electrical voltage back to the cathode whose value at any instant is proportional to the intensity of the image on the corresponding portion of the target scanned by the electron beam, which voltage has a selected non-linear characteristic corresponding to the lag characteristic of the tube, comprising:

auxiliary tube means integral with the feedback loop and having a cathode coupled directly to ground and a target disposed to also retain the same image as scanned by said photoelectric tube, wherein the auxiliary tube means and feedback loop provide the electrical voltage of selected non-linear characteristic;

said photoelectric tube including an output terminal coupled to the target thereof for supplying said video output signal; and

said target of the auxiliary tube means is coupled via the integral feedback loop back to only the cathode of the photoelectric tube.

4,598,236

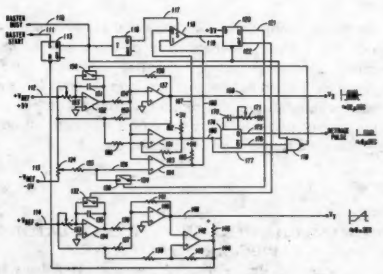
BACKGROUND RASTER GENERATOR

Mark N. Hepworth, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 22, 1983, Ser. No. 564,808

Int. Cl.[4] H01J *29/70*; H04N *3/32, 5/04*

U.S. Cl. 315—403 **5 Claims**



1. In a cathode ray tube display control apparatus, a raster generator circuit comprising:

a. means for deflection control in the X and Y axes of said display, respectively;

b. means coupled to said means for deflection control for generating a variable width retrace pulse in the X axis;

c. means coupled to said means for deflection control, for interlace control thereby allowing double line density; and

d. means for independently generating a fully rastered screen in response to a singular start-raster pulse, and coupled to said means for deflection control.

4,598,237

POWER WINDOW CONTROL APPARATUS

Kiyoshi Wada; Hitoshi Takeda; Hiroki Shibata; Atsushi Toda; Nobumi Yokoyama, and Naohiro Yamada, all of Tokyo, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Jun. 20, 1985, Ser. No. 747,157

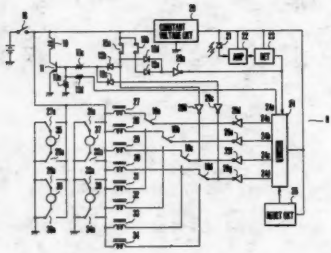
Claims priority, application Japan, Jun. 29, 1984, 59-133043; May 24, 1985, 60-110125; May 24, 1985, 60-110126; May 24, 1985, 60-110127

Int. Cl.[4] H02P *1/22*

U.S. Cl. 318—16 **8 Claims**

1. A power window control apparatus comprising a transmitter, detachably mounted to a fixed member in a compartment, for transmitting coded infrared ray signals corresponding to opening/closing operations of right and left windows of a vehicle and a receiver, fixed in the compartment, for receiving the infrared ray signal from said transmitter and provided with a photosensor for receiving a transmission signal from said transmitter, said receiver being further provided with an amplifier for amplifying an output signal from said photosen-

sor, detector means for detecting an output signal from said amplifier, a decoder for decoding a signal detected by said detector means and generating an output signal corresponding to a content of the signal received from said transmitter, a relay circuit, opening/closing contacts thereof upon generation of the output from said decoder, for controlling rotation of win-



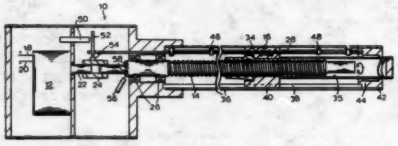
dow opening/closing drive motors, a manual switch for driving said relay circuit independently of the signal from said transmitter, a reset circuit for resetting said decoder for a predetermined period of time after an ignition switch is turned on, and a braking circuit for braking to rapidly stop a corresponding one of said motors by forming a short circuit when a driver releases a transmitter or receiver switch.

4,598,238

ELECTRO-MECHANICAL SHOWER OSCILLATOR FOR PAPERMAKING MACHINE

Robert V. Scarano, Glens Falls, N.Y., assignor to Albany International Corp., Menands, N.Y.

Filed Apr. 24, 1985, Ser. No. 726,631
Int. Cl.[4] H02P 1/22
U.S. Cl. 318—282 **14 Claims**



1. An electro-mechanical oscillator for reciprocal movement of at least one shower head, comprising:

a DC pancake gear motor having input leads for applying voltage to the motor and an output shaft which rotates in one of two directions in accordance with the polarity of said voltage;

a first member comprising a ball screw coupled to said output shaft;

a second member comprising a ball nut means mounted on said first member for moving said second member linearly in accordance with rotation of said output shaft;

a shower head operating shaft coupled to said second member; and

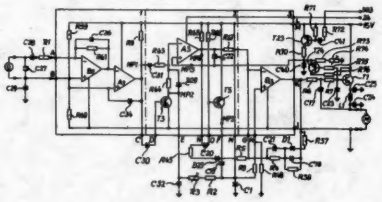
reversing means for reversing the polarity of said voltage and accordingly reversing said DC pancake gear motor when said second member reaches predetermined positions so as to reverse the movement of the shower head in a somewhat instantaneous manner to prevent undesired dwell time of said shower head during reversal.

4,598,239

CIRCUIT FOR REGULATING THE RPM AND PHASE OF A MOTOR

Heinrich Cap, St. Georgen, Fed. Rep. of Germany, assignor to Papst-Motoren GmbH & Co. KG, St. Georgen, Fed. Rep. of Germany

Filed Dec. 28, 1983, Ser. No. 566,184
Int. Cl.[4] H02P 5/16
U.S. Cl. 318—314 **39 Claims**



1. An arrangement for regulating the rpm and phase of a motor, comprising

timing circuit means producing a periodic timing signal whose value changes during the period thereof and whose frequency depends on actual motor rpm;

means generating a reference signal including a periodic component having a frequency equal to the frequency which the periodic timing signal achieves at the desired rpm;

motor-control means, including a comparator receiving said timing signal and said reference signal, and operative for controlling motor energization in dependence upon the point in time at which said timing signal reaches the value of said reference signal;

whereby, when the actual motor rpm equals the desired rpm, said point in time will vary within the period of said reference signal in a manner dependent on the phase difference between said timing signal and said reference signal,

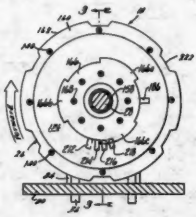
the variation of the value of said periodic component during the period thereof being so selected that said point in time can vary in a phase-difference-indicating manner within a range amounting to considerably more than half the period of said periodic component.

4,598,240

SELF SYNCHRONOUS MOTOR SENSOR SWITCHING ARRANGEMENT

Allan R. Gale, Allen Park, and David J. Gritter, Southfield, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Aug. 29, 1984, Ser. No. 645,226
Int. Cl.[4] H02P 1/16
U.S. Cl. 318—429 **5 Claims**



1. A system for providing assured start up of a multi-pole

permanent magnet electric motor from an at rest position, said motor having at least one zero torque detent, comprising:

a flag means mounted on the rotational axis of the motor for rotation with the motor;

an electrical power source;

a control circuit for controlling delivery of power from the power source to the stator of the motor, the control circuit including a first and second pair of sensors mounted in a fixed angular relationship with the stator of the motor, each sensor having a sensing region through which the flag means passes as the motor turns, each sensor generating a signal indicative of the presence or absence of the flag means in the sensing region, the first pair of sensors being mounted at a first predetermined angular distance from the zero torque detent, and the second pair of sensors being mounted at a second predetermined angular distance from the zero torque detent, said second predetermined angular distance being greater than the first predetermined angular distance;

the control circuit including means for responding to the signals generated by the sensors to control the direction of current flow through the stator of the motor;

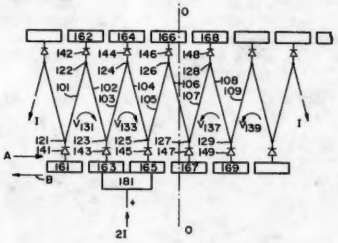
said control circuit operative to energize the motor to turn in a first direction when the motor is starting from an at rest position and including means for determining the direction of movement and angular position of the rotor as a function of the signals generated by at least the second pair of sensors as the motor starts from an at rest position, and further operative to energize the motor to turn in the opposite direction if the motor has turned in a direction opposite to said first direction far enough past one of the second pair of sensors, so that the motor, upon reversing direction and reaching the torque detent, has enough rotational kinetic energy to overcome the motor's inherent reluctance torque and begin normal operation.

4,598,241

RECTIFIER COMMUTATION IN ELECTRICAL MACHINES

Mykola Sereda, C.P. 358, Succ. K, Montréal, Québec, Canada (H1N 3L3)

Filed Jul. 12, 1982, Ser. No. 397,028
Int. Cl.⁴ H02K *13/00*
U.S. Cl. 318—439 **17 Claims**



1. A dynamo-electric machine comprising:

an armature having a plurality of coils, the interconnections of said coils forming first and second sets of nodes,

a first set of electrically isolated commutator segments,

a second set of electrically isolated commutator segments,

a first group of rectifying devices,

a second group of rectifying devices,

said first group of rectifying devices being connected to said first set of commutator segments and said first set of nodes,

said second group of rectifying devices being connected to said second set of commutator segments and and said second set of nodes,

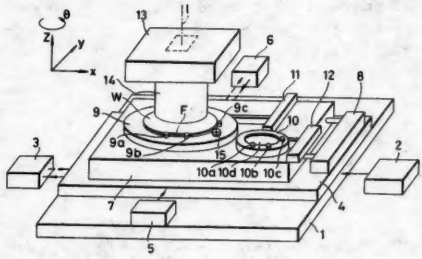
at least one brush bearing on each of said sets of commutator segments, the span of said brush being such that the brush bears on adjacent segments simultaneously.

4,598,242

MASK FEED METHOD AND APPARATUS FOR EXPOSURE REPLICATE SYSTEMS

Yutaka Hayashi, Yokohama, and Hisao Izawa, Kawasaki, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jul. 3, 1984, Ser. No. 627,449
Claims priority, application Japan, Jul. 4, 1983, 58-120409
Int. Cl.⁴ G05B *1/06*
U.S. Cl. 318—640 **8 Claims**



1. In an exposure replicate system wherein an object is mounted on an object station on a two-dimensionally movable stage and a mask containing a predetermined pattern to be placed on the object by exposure printing is held opposite to the object at a predetermined distance therefrom by mask holding means, the method of feeding the mask to the mask holding means comprising the steps of:

(a) positioning said stage at a first moving position where said object station is opposed to said mask holding means;

(b) mounting said mask on a mask station arranged on said stage at a different position from said object station;

(c) moving said stage, along with said mask station and said object station, from said first moving position to a second moving position where said mask is opposed to said mask holding means;

(d) displacing said mask station so as to make a pre-alignment of said mask with respect to said system; and

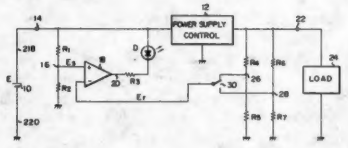
(e) transferring said prealigned mask from said mask station onto said mask holding means.

4,598,243

DIRECT-CURRENT POWER SUPPLY WITH ALARM INDICATOR

Chikuni Kawakami, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 23, 1984, Ser. No. 674,014
Claims priority, application Japan, Dec. 6, 1983, 58-229112
Int. Cl.⁴ G05F *1/46*; G01N *27/46*
U.S. Cl. 323—349 **7 Claims**



1. A direct-current power supply apparatus for supplying electric current to a load, a plurality of types of batteries being applicable to said apparatus, comprising:

housing means for installing therein a battery employed;

monitor means for monitoring a voltage output from the battery installed;

indicator means for indicating a warning condition of the battery installed;

comparing means for comparing the voltage monitored with

a reference voltage to energize said indicator means when the monitored voltage becomes lower than the reference voltage;

voltage generating means for generating a plurality of voltages as the reference voltages associated with said types of batteries available; and

selecting means for selectively supplying one of the plurality of voltages generated to said comparing means, said plurality of voltages each being set to a value higher than a limit voltage which is sufficiently low for allowing a normal operation of said load.

4,598,244

SWITCHING REGULATOR

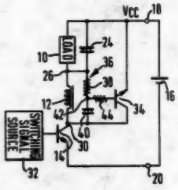
Shinichi Majima, and Atsushi Ogawa, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Apr. 2, 1984, Ser. No. 596,045

Claims priority, application Japan, Mar. 31, 1983, 58-55961; Mar. 31, 1983, 58-56090

Int. Cl.[4] G05F *1/10*

U.S. Cl. 323—351 **5 Claims**



1. A switching regulator circuit for applying a regulated DC voltage to a load comprising:

an input power supply source for supplying an unregulated DC voltage;

an output network for supplying the load with a regulated DC voltage, said output network being coupled to a first terminal of said input power supply source;

a switching element coupled to a second terminal of said input power supply source and adapted to respond to a switching signal;

means for storing energy connected between said load and said switching element, said energy storing means, said output network and said switching element being connected in series relationship across said input power supply source;

first capacitive means connected between said energy storing means and said first terminal of said input power supply source in parallel with said output network operating with said energy storing means to smooth the current flowing through said output network;

a transistor connected at its collector-emitter path between said switching element and said first end of said input power supply source in parllel with the series circuit of said output network and said energy storing means, said transistor being connected in reverse polarity with regard to said input power supply source; and

circuit means for biasing the base of said transistor, said base biasing circuit means being connected across said means for storing energy between said first end of said input power supply source and said output network.

4,598,245

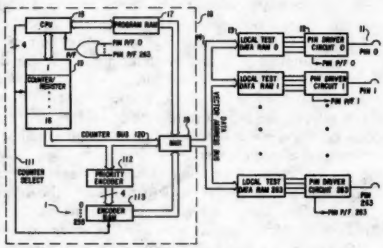
CIRCUIT TESTER HAVING INDIRECT COUNTERS

William A. Groves; Matthew L. Snook, and Rodney Browen, all of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 503,464, Jun. 13, 1983. This application Jan. 3, 1984, Ser. No. 567,588

Int. Cl.[4] G01R *31/28*; G06F *11/00*

U.S. Cl. 324—73 R **12 Claims**



1. A circuit tester comprising:

a set of n test pins on which an n-bit indirect counter is to be produced, where n is an integer;

driving means, responsive to derivative mode data vectors having n digits, each digit being associated one-to-one with one of said n test pins, for driving test vectors onto the set of test pins;

means for generating an ordered sequence of n distinct derivative mode data vectors that will produce an indirect counter on said n test pins when supplied to the driving means in order; and

means for supplying said ordered sequence of derivative mode data vectors to said driving means.

4,598,246

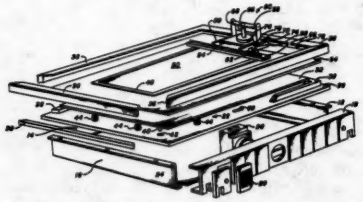
PRINTED CIRCUIT BOARD TESTER HAVING A FLEX AND WIPING ACTION FREE VACUUM ACTUATED EDGE CONNECTOR

Robert E. Staples, Lakeville; Joseph A. Ierardi, Norwood, and Willis E. Golder, Holliston, all of Mass., assignors to Pylon Company, Inc., North Attleboro, Mass.

Filed Sep. 8, 1982, Ser. No. 416,005

Int. Cl.[4] G01R *15/12, 1/02*

U.S. Cl. 324—73 PC **16 Claims**



1. A printed circuit board tester having wiping-free action, comprising:

a generally planar support having a normal to its plane for receiving a printed circuit board having a plurality of contacts to be tested spaced along a peripheral edge thereof in such a way that the edge contacts thereof are disposed on the surface of the printed circuit board but does not confront the generally planar support;

a frame;

means operatively coupled to said support for mounting said

support for movement relative to said frame in a direction defined by said normal to the plane of said support between an inoperative test position and an operative test position spacially displaced from said in-operative test position; and

means connected to said support and operative in response to the movement of said support for simultaneously electrically contacting said plurality of spaced contacts at a time when said support has been moved to its inoperative test position and for simultaneously electrically non-contacting said plurality of spaced contacts both at a time when said support has been moved to its inoperative test position, and at the times when said support is in movement through positions defined between said in-operative and said operative test positions;

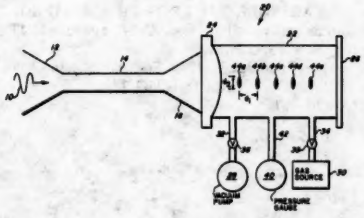
said contacting and non-contacting means includes a contact array superadjacent said support, and means for mounting said contact array to said support for motion between a third position where said contact array is in electrical communication with said spaced contacts in response to said support being in its operative test position and a fourth position where said contact array is out of electrical contact with said contacts in response to said support being in its in-operative test position.

4,598,247

SPECTRUM ANALYZER AND ANALYSIS METHOD FOR MEASURING POWER AND WAVELENGTH OF ELECTROMAGNETIC RADIATION

Frederick M. Mako, Fairfax Station; John A. Pasour, Springfield, and Charles W. Roberson, Alexandria, all of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 24, 1984, Ser. No. 583,536
Int. Cl.[4] G01R *23/16*
U.S. Cl. 324—77 R **11 Claims**



1. A spectrum analyzer for analyzing electromagnetic radiation comprising:

a chamber having chamber walls, said chamber having a gas therein, and wherein said chamber includes a transparent medium means capable of transmitting radiation therethrough into the interior of said chamber, and a reflective boundary means positioned to receive radiation transmitted into the interior of said chamber, said reflective boundary means being capable of reflecting radiation back toward said transparent medium means such that a standing wave having spatially periodic amplitude peaks is generated within said chamber:

pressure regulation means for regulating the gas pressure within said chamber:

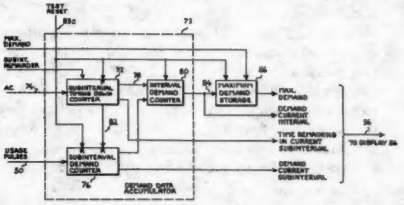
whereby gas breakdown will occur at the standing wave peaks at a certain pressure for a particular radiation wavelength, the gas breakdown generating a visible light pattern at each standing wave peak.

4,598,248

TEST OPERATION OF ELECTRONIC DEMAND REGISTER

Warren R. Germer, Dover, N.H., assignor to General Electric Company, Somersworth, N.H.

Filed Apr. 12, 1984, Ser. No. 599,735
Int. Cl.[4] G01R *11/64, 35/04*
U.S. Cl. 324—103 R **7 Claims**



1. Apparatus for providing an operating mode and a test mode for an electronic demand register of an electric meter, said electronic demand register including a digital processor of the type having a volatile memory, comprising:

means for non-volatile storage of at least a maximum demand, a remainder of a demand time period and a plurality of programmed contants upon entering said test mode;

means for retaining at least said programmed constants in said volatile memory upon entering said test mode whereby said digital processor is enabled to use said programmed constants during said test mode;

means for presetting a demand time period and at least one of a demand accumulator and a maximum demand storage for initiation of a test; and

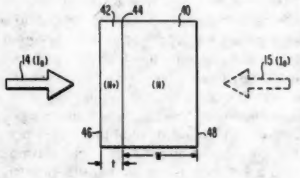
means for erasing said demand accumulator and said maximum demand storage and for restoring said maximum demand, said remainder of a demand time period and said programmed constants stored in non-volatile memory into said volatile memory upon entering said operating mode from said test mode whereby demand metering resumes from zero accumulated demand for said remainder of said demand time period before beginning to accumulate a demand over a full demand time period.

4,598,249

METHOD USING SURFACE PHOTOVOLTAGE (SPV) MEASUREMENTS FOR REVEALING HEAVY METAL CONTAMINATION OF SEMICONDUCTOR MATERIAL

Lawrence A. Goodman, Plainsboro; Alvin M. Goodman, Princeton Township, Mercer County, and Herman F. Gossenberger, North Brunswick, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Feb. 29, 1984, Ser. No. 584,814
Int. Cl.[4] G01R *31/26*
U.S. Cl. 324—158 R **18 Claims**



1. A method for revealing the presence of heavy metal impurities introduced during a processing step on a body of

semiconductor material having a surface layer with a thickness t, said body having two major surfaces comprising the steps:

(a) determining by the constant-magnitude steady-state surface photovoltage (SPV) method a first minority-carrier diffusion length (L_0) of said body formed of semiconductor material by illuminating either of said major surfaces at a step prior to forming said layer, where length (L_0) is at least as great as thickness t;

(b) forming said layer on one of said major surfaces of said body;

(c) heating said body and layer to a temperature sufficient to diffuse heavy metals present from said surface layer into said body; and

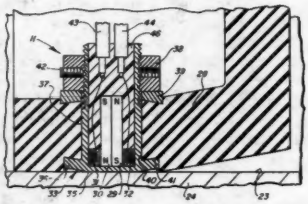
(d) determining by said SPV method a second minority-carrier diffusion length (L_1) of said body by illuminating said major surface opposite from said surface layer, whereby a large ratio of length L_0 to length L_1 is indicative of the presence of a heavy metal impurity in said layer.

4,598,250

CORROSION SENSOR DEVICE INCLUDING SIDE-BY-SIDE BAR MAGNETS SURROUNDED BY A COIL

Donald E. Lorenzi, and Helmut F. Wagerer, both of Des Plaines, Ill., assignors to Magnaflux Pipeline Services, Inc., Stamford, Conn.

Filed Feb. 19, 1982, Ser. No. 350,401
Int. Cl.[4] G01N *27/72*; G01R *33/12*; G01D *9/00*
U.S. Cl. 324—220 **6 Claims**



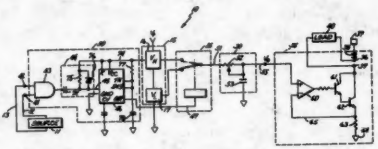
1. A sensor device, comprising: a probe having a sensing end which during use of the probe is positioned adjacent a surface of a part for detection of corrosion pits or the like, first and second elongated bar magnets positioned in said probe in fixed closely adjacent parallel relation to each other and with the north pole of said first magnet and the south pole of said second magnet adjacent each other at said sensing end of said probe and with the south pole of said first magnet and the north pole of said second magnet spaced from said sensing end, and detector means including a coil and circuit means for responding to the magnetic field through said coil, said coil being wound around said first and second elongated bar magnets in stationary relation thereto with all turns of said coil being in encircling relation to both magnets and with the net magnetic field through said coil being equal to the difference of the fields of said first and second magnets, the fields of said magnets being substantially the same when said sensing end of said probe is positioned opposite and at varying distances from a part surface portion which is free of corrosion pits, the field of said first magnet being reduced when said north pole thereof is positioned adjacent a corrosion pit while said south pole of said second magnet is opposite a part surface portion which is free of corrosion pits and to then produce a net field through said coil in one direction, and the field through said second magnet being reduced when said south pole thereof is positioned opposite a corrosion pit while said north pole of said first magnet is positioned opposite a part surface portion which is free of corrosion pits and to then produce a net field through said coil in the opposite direction.

4,598,251

FREQUENCY TO CURRENT CONVERTER CIRCUIT

David L. Wehrs, Woodbury, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Continuation of Ser. No. 388,952, Jun. 16, 1982, abandoned. This application Aug. 31, 1984, Ser. No. 645,835
Int. Cl.[4] H03K *5/00*; H03L *7/00*
U.S. Cl. 328—140 **20 Claims**



1. A circuit for converting a variable frequency cyclic input signal to a current output signal having a magnitude representative of the frequency of the input signal, the magnitude being a non-zero value for a frequency of zero Hertz, comprising:

regulated supply means for providing a first non-zero regulated electrical signal and a second non-zero regulated electrical signal, the first and second regulated signals having different magnitudes;

switching means having a switching means output responsive to the input signal and coupled to the regulated supply means for alternately providing the first regulated signal and the second regulated signal at the switching means output for lengths of time which vary relative to one another depending upon the frequency of the input signal;

averaging means coupled to the switching means output to receive the first and second regulated signals for providing an average signal from the regulated signals; and

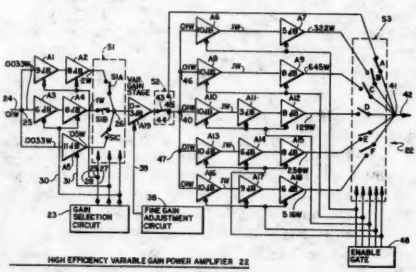
output means for providing a current output signal having a magnitude controlled by the average signal.

4,598,252

VARIABLE GAIN POWER AMPLIFIER

Constantine Andricos, Pasadena, Calif., assignor to ITT Corporation, New York, N.Y.

Filed Jul. 6, 1984, Ser. No. 628,366
Int. Cl.[4] H03G *3/00*
U.S. Cl. 330—51 **3 Claims**



1. A variable gain power amplifier comprising: a plurality of amplifiers of known gain each amplifier having an input and an output; a common input; a common output, said common input being connected to said amplifier inputs, said amplifier outputs being connected to said common output by a plurality of switches, each switch connected from one of said plurality of amplifiers to said common output, said switches being closed to increase the output signal power on said common output by

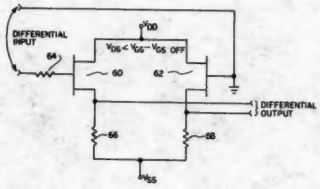
an amount equal to the increase in power delivered by the corresponding amplifier; and gain selection means connected to said amplifiers for selectively reducing the power outputs thereof to zero while opening the ones of said switches connected to amplifiers having their gain reduced to zero.

4,598,253

JFET OHMIC DIFFERENTIAL AMPLIFIER

Kenneth A. Reindel, Broadview Hts., and Thomas J. Mego, Brecksville, both of Ohio, assignors to Keithley Instruments, Inc., Cleveland, Ohio

Filed Sep. 17, 1984, Ser. No. 651,231
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—253 **5 Claims**



1. A JFET differential amplifier, comprising:

first and second JFET transistors having their drain electrodes connected in common,

first and second resistors respectively connecting the source electrodes of said transistors to a junction point,

an input circuit connected to said gate electrodes and an output circuit connected to said source electrodes,

means for applying a DC source bias voltage V_{SS} to said junction point for biasing said source electrodes through said resistors,

means for applying a DC drain bias voltage V_{DD} to said commonly connected drain electrodes,

said bias voltage applying means applying voltage of a magnitude selected so that said JFET transistors operate in the ohmic region of their characteristic drain current I_D-drain source voltage V_{DS} curve and thereby act as voltage controlled resistors whose resistance varies with the magnitude of the gate to source voltage V_{GS}.

4,598,254

MICROWAVE POWER DISTRIBUTING AND SYNTHESIZING DEVICE AND MICROWAVE POWER AMPLIFYING APPARATUS INCLUDING THE SAME

Toshiyuki Saito; Naofumi Okubo, both of Kawasaki; Yoshiaki Kaneko, Yokohama, and Yasuyuki Tokumitsu, Isehara, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 12, 1984, Ser. No. 630,240
Claims priority, application Japan, Jul. 12, 1983, 58-125533
Int. Cl.[4] H03F *3/60*
U.S. Cl. 330—286 **30 Claims**

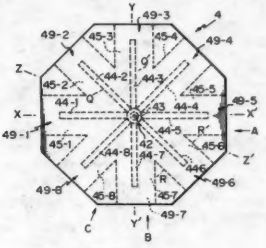
1. A microwave power distributing and synthesizing device, comprising:

a first conductive base;

a second conductive base facing said first conductive base at a first predetermined distance and having a hole with an inner conductive wall;

coaxial line means for conducting microwave power in a coaxial mode, including an inner conductive member coaxially penetrating through the hole in said second conductive base and spaced from the inner conductive wall of the hole in said second conductive base by a second predetermined distance, having a first end supported by said first base and having a second end and forming an antenna protruding out of the hole in said second conductive base, the inner conductive wall of the hole in said second conductive base forming an outer conductive member of said coaxial line means;

at least one electric field distributing and synthesizing means arranged perpendicularly to the first end of said coaxial



line means, for distributing the microwave power propagated by said coaxial line means and for synthesizing the microwave power to said coaxial line means; and

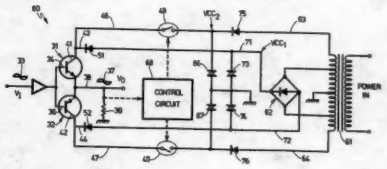
a plurality of waveguides operatively connected to said electric field distributing and synthesizing means.

4,598,255

POWER AMPLIFIER APPARATUS

Min-Tai Hong, Taipei, Taiwan, assignor to Fulet Electronic Industrial Company, Tapiei-Hsien, Taiwan

Filed Apr. 23, 1985, Ser. No. 726,041
Int. Cl.[4] H03F *3/04, 3/26*
U.S. Cl. 330—297 **19 Claims**



1. Amplifier apparatus comprising:

amplifying means for receiving input signals and for producing amplified output signals;

first means for supplying power to said amplifying means at a continuous amplifier power level and at a first, relatively low supply voltage;

second means for supplying no more than the transient power required by said amplifying means and at a second, relatively high supply voltage;

control means for coupling said first means to said amplifying means when the level of said amplified output signal is less than said first supply voltage and for coupling said second means to said amplifying means when the level of said amplified output signal is greater than said first supply voltage.

4,598,256

TUNED PHASE STABLE LIMITER AMPLIFIER

John F. Kinkel, Irvine, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 9, 1984, Ser. No. 658,349
Int. Cl.[4] H03F *3/191*
U.S. Cl. 330—302 **27 Claims**

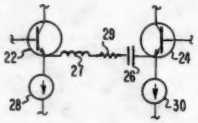
1. A tuned limiter amplifier comprising:

first and second circuit branches each having a bipolar transistor having an emitter source impedance with an inductive component thereof and a constant current circuit connected with the emitter of the transistor in a series circuit relationship;

a capacitor connected to the first circuit branch between the

emitter and the constant current circuit and connected to the second circuit branch between the emitter and the constant current circuit; and

the capacitor having a capacitance value selected so that it



resonates with the inductive components of the emitter source impedances of both transistors in a selected frequency band thereby forming a bandpass filter;

whereby a balanced push-pull circuit is formed which is tuned by the capacitor.

4,598,257

CLOCK PULSE SIGNAL GENERATOR SYSTEM

Gary D. Southard, Coral Springs, Fla., assignor to Siemens Corporate Research & Support, Inc., Iselin, N.J.

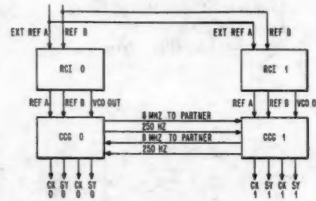
Filed May 31, 1983, Ser. No. 499,740

Int. Cl.[4] H03L *7/06, 7/14*

U.S. Cl. 331—2 **45 Claims**

MICROFICHE APPENDIX INCLUDED

(1 Microfiche, 20 Pages)



45. A system for generating a stable clock pulse signal, said system comprising in combination first and second clock generator apparatus, to which apparatus is provided a reference clock signal by an external reference clock generator, the first and second clock generator apparatus each comprising in addition to a coarse phase control loop, a fine phase control loop, comprising at least a fine phase lead-lag counting means and a fine phase latch, the fine phase control loop for providing the results of a fine phase comparison to a processing means for controlling an oscillating means shared by both the coarse and fine phase control loops, the fine phase lead-lag counting means and fine phase latch for performing the fine phase comparison of two reference clock signal outputs of the first and second clock generator apparatus, the fine phase lead-lag counting means being enabled by an output signal of an emitter coupled logic gate indicating a leading or lagging phase condition between the two reference clock signal outputs of the first and second clock generator apparatus.

4,598,258

CIRCUIT ARRANGEMENT COMPRISING A VOLTAGE-CONTROLLED OSCILLATOR OPERABLE WITH DIFFERENT SENSITIVITIES

Sotoaki Babano, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 24, 1985, Ser. No. 748,234

Claims priority, application Japan, Jun. 25, 1984, 59-130749

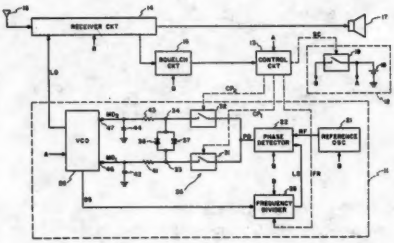
Int. Cl.[4] H03L *7/06*

U.S. Cl. 331—14 **3 Claims**

1. In a circuit arrangement comprising, for carrying out a battery saving operation, voltage producing means for producing during said battery saving operation a continuous and an intermittent source voltage with said intermittent source voltage made to alternatingly define an active and an inactive interval, phase difference detecting means energized during said active interval for detecting a phase difference between a reference and a local signal to produce a phase difference signal of a variable level corresponding to said phase difference, signal modifying means for modifying said phase difference signal into a modified signal which lasts continuously even during said inactive interval, oscillation generating means energized by said continuous source voltage and responsive to said modified signal for generating an oscillation signal of an oscillation frequency dependent on said modified signal, and supplying means for supplying said phase difference detecting means with said oscillation signal as said local signal, the improvement wherein:

said signal modifying means comprises:

signal dividing means energized during said active interval



for dividing said phase difference signal into a first and a second intermediate signal which have said variable level in common; and

signal producing means responsive to said first and said second intermediate signals for producing said modified signal with division into a first and a second modified signal;

said oscillation generating means comprising:

circuit constant providing means having a first and a second circuit constant and responsive to said first and said second modified signals for providing said first and said second circuit constants, respectively; and

an oscillator energized by said continuous source voltage and coupled to said circuit constant providing means for generating said oscillation signal with said oscillation frequency decided by one of said first and said second time constants.

4,598,259

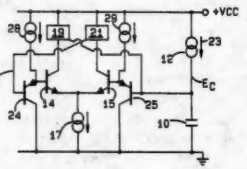
STABLE FREQUENCY SAWTOOTH OSCILLATOR

Walter S. Gontowski, Jr., Thompson, Conn., assignor to Sprague Electric Company, North Adams, Mass.

Filed Dec. 5, 1984, Ser. No. 678,330

Int. Cl.[4] H03K *3/26*

U.S. Cl. 331—111 **8 Claims**



1. An oscillator comprising:

a differential-transistor voltage comparator comprised of differentially-connected-for-alternate-conduction first and second NPN transistors, first and second PNP transistors

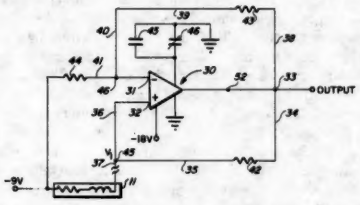
each having an emitter connected to the base of said first and second NPN transistors, respectively, a first and second current source connected to said emitters of said first and second PNP transistors, respectively;
a capacitor;
a means for charging said capacitor
a means for connecting said capacitor to one input of said comparator at the base of said second PNP transistor;
a means for applying a high reference voltage at the other input of said comparator at the base of said first PNP transistor when said first NPN transistor is conducting and for applying a relatively low reference voltage at said other comparator input when said second NPN transistor is conducting; and
a discharging means for discharging said capacitor when said second NPN transistor is conducting.

4,598,260

EDDY CURRENT PROXIMETER

William W. Carr, Phoenix, Ariz., assignor to Transducer Limited Partnership, Tempe, Ariz.

Filed Apr. 18, 1984, Ser. No. 601,430
Int. Cl.[4] H03B *5/20*
U.S. Cl. 331—135 **2 Claims**



1. An inductive oscillator circuit including
a. a amplifier having a phase shift and an output and an input, said input including a positive input terminal and a negative input terminal;
b. first positive feedback means connecting said amplifier output to said amplifier positive input terminal;
c. second negative feedback means connecting said amplifier output to said amplifier negative input terminal;
d. inductive means including first resistor means;
e. means connecting said inductive means to said first feedback means to produce a signal at said positive input terminal which is variable in accordance with the inductance of said inductive means, said inductive means causing a phase shift in said voltage signal traveling through said first feedback means from said output to said positive input terminal;
f. second resistor means in said first positive feedback means; and
g. third resistor means in said second negative feedback means;
said phase shift of said amplifier enabling
h. said phase shift in said voltage signal traveling through said first feedback means; and,
i. oscillation to occur in said circuit.

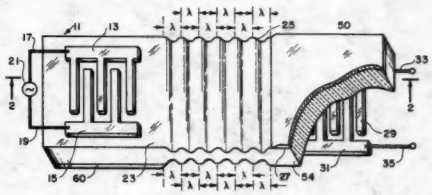
4,598,261

MICROWAVE SAW MONOCHROMATOR

Arthur Ballato, Long Branch, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 24, 1985, Ser. No. 737,627
Int. Cl.[4] H03H *9/64*
U.S. Cl. 333—195 **13 Claims**

1. An acoustic surface wave device comprising:
a substrate of material capable of supporting both surface acoustic waves and bulk acoustic waves, said substrate having first and second opposing surfaces;
input means for launching surface acoustic waves along said first surface of said substrate;
a first group of periodic corrugations disposed along said first surface of said substrate to scatter selective surface acoustic waves emanating from said input means into bulk acoustic waves, said first group of periodic corrugations having profiles with sloping sides;
a second group of periodic corrugations of the same perio-



dicity as said first group of corrugations, said second group being disposed along said second surface of said substrate and generally aligned with said first group, said second group of corrugations having profiles with sloping sides, said second group of corrugations being capable of convertingselected bulk acoustic waves into selected surface acoustic wave vibrations which propagate along said second surface of said substrate; and
output means for receiving said selected surface acoustic waves progagating along said second surface of said substrate.

4,598,262

QUASI-OPTICAL WAVEGUIDE FILTER

Ming H. Chen, Ranco Palos Verdes, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Jun. 8, 1983, Ser. No. 502,072
Int. Cl.[4] H01P *1/207*
U.S. Cl. 333—208 **11 Claims**

1. A quasi-optical waveguide filter, comprising:
a waveguide section, having an axis of energy propagation, and including means for coupling said section to other elements of a waveguide system;
a plurality of gratings installed in said waveguide section at uniform intervals along the axis of propagation and substantially perpendicular to it, each of said gratings having a pattern of conductive strips formed on an insulating layer, the pattern conforming to the contours of a selected waveguide mode, whereby each of said gratings is operative to selectively transmit a first wave in the selected waveguide mode, linearly polarized in a direction parallel with the strip pattern on a first one of said gratings, and a second wave in the selected waveguide mode, linearly polarized in a direction perpendicular to the first wave;
wherein the angular orientation of the first of said gratings is aligned with the direction of linear polarization with the first wave and the angular orientations of said gratings with respect to each other are selected to provide a selected frequency characteristic to said filter.

4,598,263

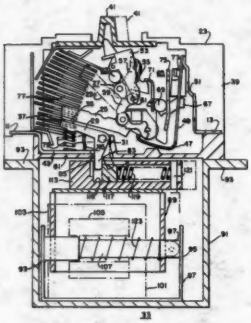
MAGNETICALLY OPERATED CIRCUIT BREAKER

Carl J. Heyne, Hampton Township, Allegheny County; Nicholas A. Tomasic, Plum, and Jiing-Liang Wu, Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 13, 1984, Ser. No. 670,792

Int. Cl.[4] H01H 73/00, 77/10

U.S. Cl. 335—14 6 Claims



1. A magnetically operated circuit breaker comprising.

an electrically insulating housing including a bottom wall;

a circuit breaker structure within the housing and comprising first and second separable contacts operable between open and closed positions;

a releasable mechanism in an initial position and movable when released to a tripped position to effect automatic opening of the contacts;

the first contact being connected to the releasable mechanism;

the second contact being movable between open and closed positions of the first contact when the first contact is in the untripped position of the releasable mechanism;

electromagnetic actuating means for moving the second contact between open and closed positions of the first contact when untripped and in response to a control signal generated remotely from the circuit breaker;

the first and second contacts being mounted on first and second contact mounting arms, respectively, which arms extend in substantially parallel spaced locations to effect current limiting relationship between the arms;

the second contact arm being pivotally mounted for movement;

the second contact arm being within the zone of influence of the electromagnetic actuating means;

the electromagnetic actuating means comprising a solenoid having a plunger movable against the second contact arm;

the electromagnetic actuating means including an operator for moving the second contact arm and comprising a frame, and a carriage movable on the frame and an electromagnetic actuator coupled to the carriage for moving the carriage and the carriage being connected to the second contact arm to effect movement thereof between open and closed positions.

4,598,264

LOCKING MECHANISM FOR A MUTUAL MECHANICAL INTERLOCKING OF TWO ADJOINING SWITCH APPARATUSES

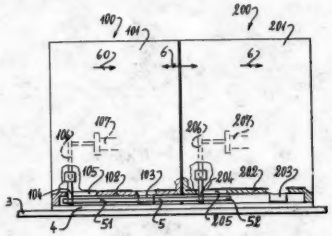
Heinz Suter, Aarau, Switzerland, assignor to Sprecher & Schuh AG, Aarau, Switzerland

Filed Nov. 15, 1984, Ser. No. 672,109

Claims priority, application Switzerland, Nov. 21, 1983, 6230/83

Int. Cl.[4] H01H 9/20

U.S. Cl. 335—161 5 Claims



1. A locking mechanism for a mutual interlocking of two switch apparatuses mounted in succession in a directly adjoining manner relative to their direction of switching movement, each apparatus having a casing, an armature and an outwards projecting extension movable by the armature during the switching operation of its switch apparatus, which extensions of the two apparatuses are operatively interconnected by a locking member,

wherein the two switch apparatuses are arranged at an equidirectional closing direction of movement of their armature, and wherein said locking member comprises a two-armed lever which is pivotable about a pivot axis and is provided at both lever arms with one each of two reciprocally equidirectional L-shaped coulisses receiving each one of said extensions in a limited movable manner, whereby upon a closing movement of one of said switch its extension enters into one path section of its coulisse, pivots said lever around its pivot axis causing the other extension to enter into a path section of its coulisse extending at least such time perpendicularly to said direction of switching movement, wherein a path section of each coulisse is arranged extending along a circle extending around the pivot axis of the lever, and another path section of each coulisse extends at an acute angle relative to the direction of the radius of the lever.

4,598,265

CAPACITOR FUSE LEADER FLIPPER

Lawrence M. Burrage, So. Milwaukee; J. Howard Shaw, Racine, both of Wis.; James R. Marek, Olean, N.Y., and David W. Anderson, Greenwood, S.C., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Sep. 6, 1984, Ser. No. 648,033

Int. Cl.[4] H01H 71/20, 73/22

U.S. Cl. 337—219 29 Claims

1. In a fuse of the type having a generally cylindrical fuse tube a fusible element carried within the tube and a fuse leader, said leader having two ends with one of the ends of the leader connected to the fusible element and with the other end adapted to be connected to a fixed terminal located at a spaced distance from the fuse, a flipper comprising:

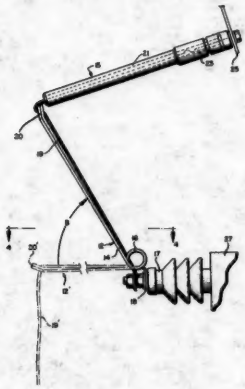
a. two elongated arms disposed adjacent one another, each of said arms having two ends which are oppositely disposed, said arms defining a plane which is disposed at an angle to the axis of the fuse tube;

b. spring means, at one end of each of said arms, for biasing the other end of each arm away from the fuse;

c. hook means, carried by said spring means, for joining said

spring means to the terminal to which said fuse leader is connected; and

d. connection means at the other end of said arms, for receiving said fuse leader intermediate the ends of the leader, said arms having a sufficient length such that, when said



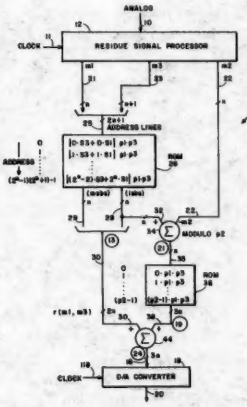
leader is passed through said connection means and connected to the terminal, said spring means is overcome, whereby in the event that the leader is released by the fuse, the free end of the leader is flung away from the fuse and is held at a spaced distance from the terminal.

4,598,266

MODULO ADDER

Peter S. Bernardson, Tempe, Ariz., assignor to GTE Communications Systems Corporation, Phoenix, Ariz.

Filed Sep. 24, 1984, Ser. No. 653,411
Int. Cl.[4] H03M 1/12
U.S. Cl. 340—347 DD **10 Claims**



1. Apparatus for converting binary signals a and b, which are made up of pluralities of binary bits, to a binary representation of the modulo **p1*p3** sum thereof, said apparatus comprising:

first means operative for summing the signals a and b for producing a first binary signal;

second means responsive to bits of the first signal for producing a second binary signal which is proportional to the product of the constant 2^{2n} and the integer part of the first signal divided by 2^{2n};

third means responsive to the second signal and said bits of the first signal for producing a third binary signal which is proportional to the difference between the second signal and the integer part of the first signal divided by 2^{2n};

fourth means responsive to the first signal and the third signal for producing a fourth binary signal which is proportional to the difference therebetween;

fifth means for generating a fifth binary signal that is proportional to a constant $(2^{2n}-1)$;

sixth means responsive to the fourth and fifth signals for passing the fifth signal as an output signal thereof only when said fourth signal is greater than or equal to said fifth binary signal representation of said constant $(2^{2n}-1)$; and

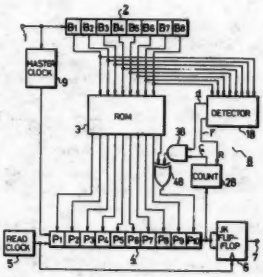
seventh means responsive to the fourth signal and the output signal of said sixth means for producing a seventh binary signal which is proportional to the difference therebetween and which corresponds to the desired output signal a+b taken modulo $(2^{2n}-1)$.

4,598,267

METHOD AND APPARATUS FOR CONVERTING A DIGITAL SIGNAL

Shinichi Fukuda, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 26, 1984, Ser. No. 604,017
Claims priority, application Japan, Apr. 26, 1983, 58-73323
Int. Cl.[4] H03M 7/20
U.S. Cl. 340—347 DD **19 Claims**



1. A method of providing a bi-level digital signal having a DC component substantially equal to zero and a predetermined maximum time between level transitions, the method comprising:

dividing a base digital signal into a series of base words each with n bits of data, where n is eight;

converting said base digital signal into a converted digital signal by matching a converted word with each said base word, each said converted word having m bits of data, wherein m is ten and said converted digital signal has a maximum number of consecutive digital zeroes equal to three, said converted words including a plurality of primary combinations of m bits having a DC component substantially equal to zero when NRZI-coded and a plurality of secondary combinations of m bits having a DC component with an absolute value of two when NRZI-coded, and in which said primary combinations begin with a maximum of two digital zeroes, end with a maximum of one digital zero, and have a maximum of three consecutive digital zeroes anywhere therein;

providing said secondary combinations with DC components when NRZI-coded so that a portion of said converted digital signal including a pair of said secondary combinations has a DC component substantially equal to

zero when NRZI-coded, and in which said secondary combinations have convention DC components, defined as the DC component when the preceding combination ends at a lower signal level, when NRZI-coded, of +2 and −2 begin with a maximum of two digital zeroes, end with a maximum of one digital zero, and have a maximum of three consecutive digital zeroes anywhere therein; and

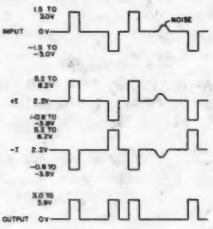
generating said converted digital signal as an NRZI-coded digital signal.

4,598,268

DIGITAL SPAN CONVERSION CIRCUIT

Thomas J. Perry, Phoenix, Ariz., assignor to GTE Automatic Electric Inc., Northlake, Ill.

Filed Jun. 22, 1983, Ser. No. 506,572
Int. Cl.[4] H04L *25/06*
U.S. Cl. 340—347 DD **14 Claims**



1. In a telecommunications switching system having a CPU, a conversion circuit being connected to a digital span via a transformer and to a switching network of said switching system for converting data of a first coding to data of a second coding, said conversion circuit comprising:

impedance control means connected to said CPU and operated in response to a first signal of said CPU to select a first impedance value of said circuit for a first value of said first signal or alternatively to select a second impedance value of said circuit for a second value of said first signal;

voltage detection means connected to said transformer and to said impedance control means, said voltage detection means being operated in response to said data of said first coding to produce a second signal representing a peak amplitude of said data of said first coding;

voltage divider means connected to said voltage detection means and operated in response to said second signal to produce a third signal representing approximately one-half the amplitude of said second signal; and

comparator means connected to said transformer and to said voltage divider means, said comparator means being operated in response to said data of said first coding and to said third signal to produce an output signal for said data of said first coding having an amplitude in excess of said amplitude of said third signal, said output signal being said data of said second coding compatible with said switching network.

4,598,269

METHOD AND APPARATUS FOR PROCESSING AN ANALOG SIGNAL

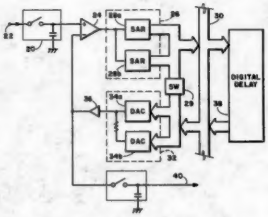
Bruce J. Penney, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jun. 13, 1984, Ser. No. 620,195
Int. Cl.[4] H03M *1/02, 1/46*
U.S. Cl. 340—347 AD **16 Claims**

1. An apparatus for processing an analog signal comprising:

a successive approximation analog-to-digital converter (ADC) having an input for receiving an analog input signal and an output at which a final digital input signal representing the value of the analog input signal is made available at a selected time, said ADC including a digital-to-analog converter (DAC) which receives a sequence of digital signals generated by the ADC at successive times prior to said selected time and provides in response to each digital signal of the sequence an intermediate analog signal corresponding to said digital signal for comparison with the analog input signal to develop the final digital input signal;

digital processing means for receiving the final digital input signal and providing a digital output signal at a predetermined time relative to said selected time, said digital output signal being substantially identical to the final digital input signal, and said DAC also being connected to receive said digital output signal from the digital processing means and provide an output analog signal corresponding to said digital output signal; and



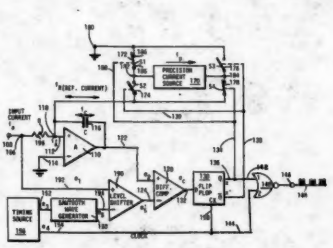
means for switching the input of said DAC between the sequence of digital signals generated by the ADC to develop the final digital input signal and the digital output signal from the digital processing means to provide the output analog signal.

4,598,270

PRECISION INTEGRATING ANALOG-TO-DIGITAL CONVERTER SYSTEM

Sidney G. Shutt, Brea, and Adrian K. Dorsman, Bellflower, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 4, 1984, Ser. No. 657,647
Int. Cl.[4] H03K *13/20*
U.S. Cl. 340—347 NT **14 Claims**



1. An analog-to-digital conversion system comprising:

means for generating a precision unipolar constant current;

a summing terminal for receiving an analog current;

an input terminal for receiving an input analog current;

means coupled to said summing and input terminals for developing a first voltage signal proportional to said input analog current and for providing an analog current to said summing terminal substantially equal to said input analog current;

an integrator, coupled to said summing terminal, for generating a second voltage signal proportional to the integral of

the sum of currents flowing through said summing terminal;

a reference terminal at a reference potential, such as ground;

means for enabling the precision unipolar current to flow by way of a first direction through said enabling means from said reference terminal through said generating means to said summing terminal during a first mode of operation and to flow by way of a second direction through said enabling means from said summing terminal through said generating means to said reference terminal during a second mode of operation;

a timing source for developing a reference signal and a clock signal;

a generator responsive to the reference signal for developing a sawtooth wave signal;

a level shifter responsive to said first voltage signal and to said sawtooth wave signal for developing a shifted signal by shifting the level of said sawtooth signal by an amount proportional to the amplitude of said first voltage signal;

a comparator for developing a comparison signal in response to said second voltage signal and said shifted signal, said comparison signal being in a first binary state when said second voltage signal is in a first polarity relationship with respect to said shifted signal and in a second binary state when said second voltage signal is in a second polarity relationship with respect to said shifted signal;

a flip-flop responsive to said comparison signal and said clock signal for developing said first and second complementary signals, said first and second complementary signals controlling said first and second modes of operation of said enabling means; and

an output circuit responsive to a preselected one of the first and second complementary signals and to the clock signal for generating the digital representation of the amplitude of the input analog current.

4,598,271

CIRCUIT ARRANGEMENT FOR MONITORING NOISE LEVELS OF DETECTORS ARRANGED IN AN ALARM INSTALLATION

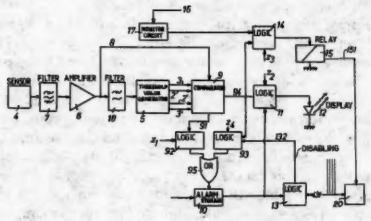
Peter Wägli, Jona-Wangen, and Stefan Temperli, Stäfa, both of Switzerland, assignors to Cerberus AG, Männedorf, Switzerland

Filed Feb. 21, 1984, Ser. No. 582,018

Claims priority, application Switzerland, Mar. 4, 1983, 1182/83

Int. Cl.[4] G08B *29/00*

U.S. Cl. 340—511 **12 Claims**



1. An electronic circuit arrangement for monitoring a signal noise-layer of at least one detector employed in an alarm system comprising:

circuitry connected with said at least one detector and receiving an output signal generated by said at least one detector;

said circuitry generating an alarm threshold signal and comparing said output signal generated by said at least one detector with said alarm threshold signal;

an alarm storage;

said alarm storage being set into a predetermined state when an alarm condition is detected;

said circuitry generating at least one noise-level warning threshold related to a working point level of said output signal generated by said at least one detector;

said circuitry allowing for a displacement of said working point level in generating said at least one noise-level warning threshold; and

said circuitry being operatively connected with said alarm storage and setting said alarm storage into a further state without transmitting an alarm signal when said output signal generated by the at least one detector exceeds in value the at least one noise-level warning threshold without exceeding said alarm threshold signal.

4,598,272

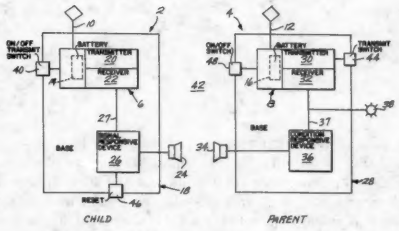
ELECTRONIC MONITORING APPARATUS

Randall P. Cox, 3570 St. Mathews Ct. SE., Port Orchard, Wash. 98366

Filed Aug. 6, 1984, Ser. No. 638,197

Int. Cl.[4] G08B *1/08*

U.S. Cl. 340—539 **8 Claims**



1. Electronic monitoring apparatus whereby a person can monitor the whereabouts of another person, pet or article, and when desired, locate the monitored person, pet or article if he, she or it becomes separated from the monitoring person, or is shielded from the latter by an obstruction, comprising first and second base forming means which are separate and independent from one another, the first base forming means being portable and securable to the person, pet, or article to be monitored so that they are transportable with him, her or it to points spaced apart from the second base forming means, and being equipped with first antenna means and battery operated first radio transmitter means which are operable through the first antenna means to broadcast a first radio signal into the aforesaid space between the respective base forming means, the second base forming means having first radio receiver means thereon and second antenna means connected therewith through which they receive the first radio signal at least up to the incidence of a predetermined threshold condition therein, there being means for producing a first alarm which is audible or visible to a person in the ambient region surrounding the second base forming means, condition responsive means responsive to the incidence of the threshold condition in the first receiver means to actuate the first alarm producing means, and second radio transmitter means which are operable through the second antenna means to broadcst a second radio signal into the space between the respective base forming means, the second transmitter means having selectively operable control means connected therewith whereby the monitoring person can actuate the second transmitter means to broadcast the second radio signal into the space between the base forming means when desired, and the first base forming means also having means thereon for producing a second audible alarm, battery operated second radio receiver means thereon for receiving the second radio signal through the first antenna means, and signal responsive means thereon which are responsive to receipt of the second radio signal to actuate the second

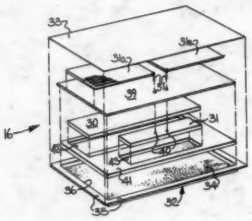
alarm, the second alarm being adapted so that it is audible within a range of distance from the first base forming means commensurate with the threshold condition in the first receiver means, so that the monitoring person, upon hearing or seeing the first alarm, can actuate the second transmitter means to locate the monitored person, pet or article by the sound of the second alarm thereon.

4,598,273

LEAK DETECTION SYSTEM FOR ROOFS

Bynum O. Bryan, Jr., 447 Suite B. South Sharon Amity, and Earl Seagrave, 2915 Providence Rd., both of Charlotte, N.C. 28211

Filed Aug. 16, 1984, Ser. No. 641,516
Int. Cl.[4] G08B *1/08, 21/00*
U.S. Cl. 340—539 **9 Claims**



5. A leak detection system for composite roof structures comprising a plurality of self-contained, indenpendent moisture detecting and signalling units adapted to be place in a predetermined spaced apart insular arrangement beneath a water impermeable membrane of the roof strucutre, each of said leak signalling and detecting units comprising:

moisture detecting and power supply means adapted to be activated and to produce electrical energy upon the introduction of water above a predetermined amount, said moisture detecting and power supply means comprising a water-activatable power source which is rendered active upon contact with moisture when a leak occurs,

signalling means connected to said moisture detecting means for emitting a signal upon activation of said moisture detecting means.

4,598,274

SECURITY AND PROTECTION PANEL

Alan Holmes, Darlington, United Kingdom, assignor to Romag Holdings Ltd., Bladon on Tyne, England

Filed Aug. 10, 1984, Ser. No. 639,309
Claims priority, application United Kingdom, Aug. 18, 1983, 8322258
Int. Cl.[4] G08B *13/04;* E06B *5/10*
U.S. Cl. 340—550 **10 Claims**

1. In a security panel of the type having

(i) a plurality of transparent overlying sheets forming a laminated transparent panel,

(ii) a transparent coat of semiconductive material disposed upon a surface of one of the sheets, the coated surface being in the interior of the panel, and

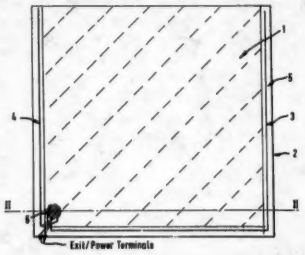
(iii) electrodes disposed on the panel at opposite edges of the transparent coat and providing electrical connections to the transparent coat,

the improvement comprising

(a) integrated circuit means for sensing a change in the electrical resistance of the transparent semiconductive coat, the integrated circuit means being situated in the interior of the panel adjacent an outer edge thereof,

(b) signal transmission means disposed adjacent an outer edge of the panel and coupled to the integrated circuit means for transmitting signals from the integrated circuit means to an external receiver,

and wherein



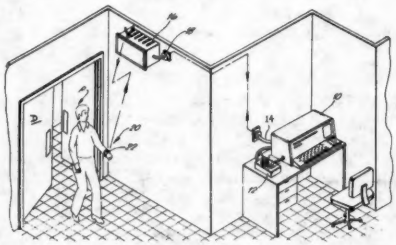
(c) the aforesaid electrodes electrically connect the semiconductive coat to the integrated circuit means by paths situated internally in the panel.

4,598,275

MOVEMENT MONITOR

Clive Ross, Downsview, and Ralph P. Devoy, Scarborough, both of Canada, assignors to Marc Industries Incorporated, Mississauga, Canada

Filed May 9, 1983, Ser. No. 492,669
Int. Cl.[4] G08B *23/00*
U.S. Cl. 340—573 **13 Claims**



1. A proximity monitoring system for detecting and individually identifying the proximity of any object or person from a group of objects or persons, and comprising:

a central information processor, and processor signal receiver means connected thereto;

a plurality of remote detector modules adapted to be placed in various locations at a distance from said central information processor, each module having a module first transmitter means for communicating with said processor signal receiver means and having a module second transmitter means operable to emit a standard, uniform "switch-on" signal for communicating with any object or person to be identified in said group, in the immediate proximity of said module, and module receiver means for receiving a signal from any object or person to be identified in the immediate proximity of said module,

a plurality of individual personalized portable identifier units adapted to be associated with each said object or person in said group, each identifier unit comprising a continuously activated identifier receiver adapted to receive said uniform "switch on" signal when in the immediate proximity of any of said remote detector modules, a coded signal identifier transmitter which is normally de-activated, a battery power means, and switch means operated by the identifier receiver in response to any said uniform "switch

on" signal from any said module second transmitter means of any of said remote detector modules when said identifier unit is in the immediate proximity of said module to connect said battery power means to said identifier transmitter thereby activating same for emitting a personalized coded identification signal to said module receiver means of said module; and,

said module receiver means being operable, in response to a said coded identification signal, to cause said module first transmitter means to transmit a coded information signal to said processor signal receiver means, and,

and said processor signal receiving means being operable, in response to said coded information signal from said module first transmitter means, to cause said central information processor to process information corresponding to said coded information signal.

4,598,276

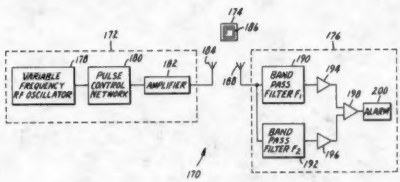
DISTRIBUTED CAPACITANCE LC RESONANT CIRCUIT

William C. Tait, Oak Park Heights, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 552,305, Nov. 16, 1983. This application Nov. 6, 1984, Ser. No. 667,607

Int. Cl.[4] G08B *13/24*

U.S. Cl. 340—572 **2 Claims**



1. An electronic article surveillance system comprising a transmitter for transmitting radio frequency energy at at least two predetermined frequencies,

a marker containing a circuit comprising a dielectric sheet having on each surface thereof a conductive multi-turn spiral each turn of which forms a substantially closed loop and is in substantial registration with an opposing turn of the spiral on the opposite surface, each of the multi-turn spirals being oppositely wound with respect to each other when both are viewed from the same side of the sheet to thereby form a series of closed loops having both inductive and distributed capacitive components which in combination resonate at at least said two predetermined frequencies, and

a receiver for receiving signals resulting from the circuit resonating at said two predetermined frequencies and for creating an output signal in response to the receipt of said resultant signals.

4,598,277

WATER DETECTION SUBASSEMBLIES AND METHOD OF FORMING SAME, FOR USE IN COMPUTER PROCESSING CENTERS

Richard B. Feldman, San Mateo, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jul. 30, 1984, Ser. No. 635,687

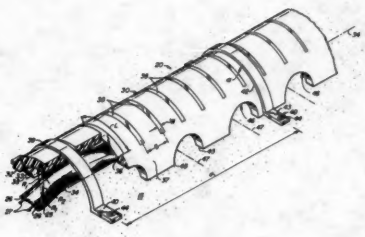
Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—604 **6 Claims**

1. Method of forming a series of water detection subassemblies in association with a water detection system for use in a digital computing center, said center including a computing room having a raised floor above a non-trafficked sub-floor but said raise floor also supporting computer equipment and the like, comprising:

(i) forming a plurality of perforated plastic shields each of substantially semi-circular cross-section, wherein the perforations of each shield are formed into first and second series of openings therealong, said first series comprising sets of arcuate openings coincident with the apex of the shield and periodically spaced therealong, each opening having a common arcuate length L, a width W and internal spacing S and being of sufficient dimension to allow easy entry of aerosol mixtures of air and water droplets originating from above said each shield but in combination with neighboring openings, not to unduly weaken said each shield and allow collapse thereof during repair, replacement or renovation of said computing equipment, and the second series of openings comprising sets of openings along terminating longitudinal edges of the shield to allow easy entry of water at sub-floor level interior thereof;

(ii) positioning a fabric mesh formed of an electrically non-



conducting material and physically supporting a pair of conductors, upon the sub-floor in a predetermined pattern;

(iii) attaching said shields to said sub-floor along the terminating longitudinal edges thereof about said fabric mesh;

(iv) electrically connecting said pair of conductors supported by the fabric mesh to a voltage source means of said detection system whereby water gaining entry through either first or said second series of openings and contacting said conductors adjacent said sub-floor establishes a low-resistance bridge shunting said pair of conductors and permits current flow therethrough for use in warning operators of said water invasion, but wherein said mesh and conductors are completely protected against physical abuse as from contact with workmen's shoes and the like during repair, replacement or renovation of said computing equipment.

4,598,278

EARLY WARNING OF MARINE COOLING SYSTEM FAILURE

John R. Ford, Xenia, Ohio, assignor to Vernay Laboratories, Inc., Yellow Springs, Ohio

Filed Jan. 26, 1983, Ser. No. 461,081

Int. Cl.[4] G08B *21/00, 23/00*

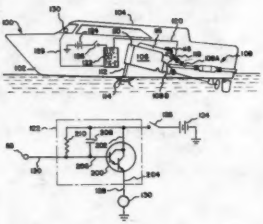
U.S. Cl. 340—608 **8 Claims**

1. In a marine cooling system wherein cooling water is drawn from the body of water supporting a watercraft utilizing a marine engine, said water being drawn through a water inlet, circulated to cool said engine, and discharged back to said body of water through an exhaust conduit of said engine, an early warning system for detecting the failure of said marine cooling system comprising:

a water sensing element supported within and electrically insulated from said exhaust conduit, said sensing element being exposed within said exhaust conduit and grounded by water within said exhaust conduit, said water serving as an electrical conductor to ground the exposed portion of said water sensing element within said exhaust conduit;

circuit means connected to said water sensing element for

generating an alarm signal if water flow is not sensed within said exhaust conduit as indicated by ground being removed from said sensing element due to the rapid drying of said sensing element within said exhaust conduit; and



alarm means responsive to said alarm signal for warning the operator of said watercraft of impending engine overheating upon detection of a lack of water flow in said cooling system.

4,598,279

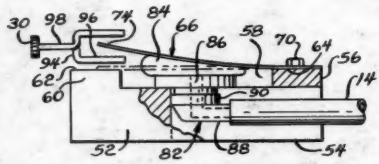
PRESSURE MONITOR

Christopher Nowacki, Arlington Heights, and Alfred G. Brisson, Schaumburg, both of Ill., assignors to Trutek Research, Inc., Arlington Hts., Ill.

Filed Oct. 13, 1983, Ser. No. 541,686

Int. Cl.[4] G08B *21/00;* **A61M** *16/00*

U.S. Cl. 340—626 **6 Claims**



1. A pressure monitor comprising base means, a contact member mounted on said base means and normally biased to a rest position, a pneumatic device on said base means adjacent said contact member and expansable in accordance with internal gas pressure against said contact member to move said contact member from rest position, means for connecting an external pneumatic line to said pneumatic device, the position of said contact member being determined by its resilient biasing and said internal gas pressure, a pair of electric contacts respectively engageable by said contact member as gas pressure increases or decreases beyond predetermined limits, high pressure and low pressure alarm means respectively connected to said pair of contacts and respectively energized when said contact member engages one of said pair of electrical contacts, means for respectively adjusting the position of said pair of contacts, the pair of contacts respectively comprising crank arms adjustable by rotation thereof.

4,598,280

ELECTRIC CHIP DETECTOR

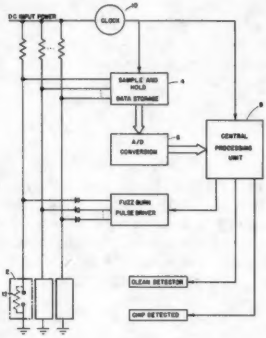
Michael P. Bradford, Orange, Conn., assignor to The United States of America as represented by the Secretary of the Army, Alexandria, Va.

Filed Aug. 20, 1984, Ser. No. 642,302

Int. Cl.[4] G01R *27/02, 33/12;* **G01N** *15/06*

U.S. Cl. 340—631 **3 Claims**

1. A data circuit for wear particle detectors of the type having a pair of electrically actuated electrodes disposed in lubricant to attract and collect wear particles comprising input circuit means for incrementally determining wear particle detector resistance values R_1, R_2, R_3 . . . R_n where n is the number of resistance values determined, means for storing the resistance values, means for converting stored resistance values to digital input data, comprising means for differentiating successive resistance values according to the equation $dR_n/dt=(1/\Delta t)(R_{n+1}-R_n)$, first output circuit means signal-



ing, when dR_n/dt is greater than k1, and R_n is less than k_2, that a large wear particle has been detected, means activating a one-shot multivibrator when Rn is equal to or less than k2, and second output circuit means signaling, when R_n is less than k2, that the detector should be cleaned, k1 being a number in the range of -10 to -100 kilohms per second k2 being a number in the range of 17 to 23 kilohms.

4,598,281

ELECTRICAL LINE INTERRUPTION DETECTION AND ALARM CIRCUIT

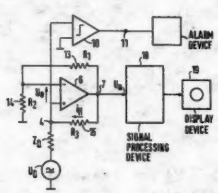
Michael Maas, Uttenreuth, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 2, 1983, Ser. No. 557,519

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1982, 3246473

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—664 **14 Claims**



1. A circuit for detecting excessive impedances between a body under test and an input of a signal processing device which contains an amplifier, said signal processing device being connected to said body by a low impedance electrical connection, and said input having a voltage applied thereto by said connection comprising:

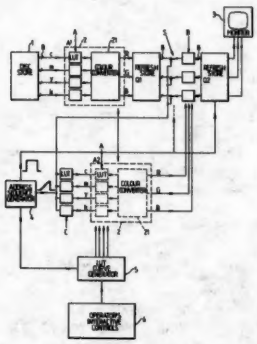
(a) a supply circuit to supply a variable auxiliary DC current to said electrical connection, said circuit operating to increase said current with increasing voltage at said input; and

(b) an alarm device which generates an alarm indicating excessive impedance when said input voltage is outside a predetermined range.

4,598,282
VIDEO RETOUCHING SYSTEM

Peter C. Pugsley, Middlesex, England, assignor to Crosfield Electronics Limited, London, England

Filed Mar. 25, 1983, Ser. No. 478,944
Claims priority, application United Kingdom, Mar. 30, 1982, 8209323
Int. Cl.⁴ G09G *1/28*
U.S. Cl. 340—703 **11 Claims**



8. Apparatus for effecting a retouching operation on an image represented by electric signals displayed on a monitor screen, comprising:

a source of colour-component image signals representing values of printing ink colour components for picture elements of the image;

a colour converter for converting the printing ink colour component signals into three monitor format colour component signals, the converter simulating the effect of the printing inks used in a colour printing process;

a refresh store receiving the monitor-format signals from the colour converter and applying them to the monitor;

and further comprising, for each monitor format colour component a 1-dimensional look-up table connected between the refresh store and the monitor;

for each printing ink colour component a 1-dimensional look-up table;

control means for controlling the contents of the printing colour look-up tables; and

means for converting the 1-dimensional functions set into the 1-dimensional printing colour look-up tables into three 1-dimensional functions for monitor format signals and loading the resulting functions into the three monitor format look-up tables;

whereby an image, modified by the use of the control means, is displayed on the monitor and the corresponding modifying functions stored in the printing colour look-up tables can be used directly in the preparation of modified colour separations.

4,598,283
METHOD FOR CONVERTING THE NUMBER OF BITS OF INPUT BIT STREAM

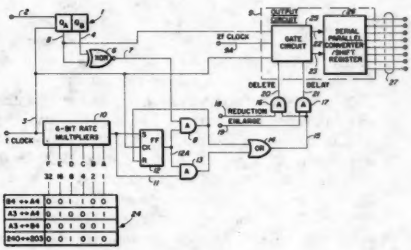
Min-Hsiung G. Tung, Matthews, N.C., and Hiroshi Yanagisawa, Yokohama, Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 18, 1984, Ser. No. 621,824
Claims priority, application Japan, Aug. 25, 1983, 58-154228
Int. Cl.⁴ G09G *1/16*
U.S. Cl. 340—731 **11 Claims**

1. In a method of processing image data for scaling the image from a first size to a second size and wherein the image data includes a line of pel indicating bits in a raster of pel indicating bits representative of an image being processed, including the machine implemented steps of:

selecting a scaling ratio for changing the size of an image to be processed;

partitioning the pel indicating bits in said line into a plurality of bit groups equal to the number of bits to be added for enlarging said image or deleted for reducing said image from said line of pel indicating bits to approximately achieve the selected scaling ratio;



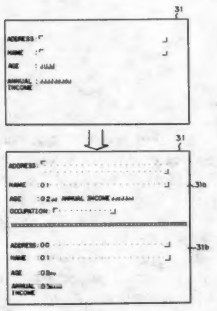
examining each of the bit groups for finding one pair of adjacent like pel indicating bits, for enlarging the image adding a pel indicating bit equal to the found pair of examined pel indicating bits for creating three adjacent like pel indicating bits and for reduction deleting a one of said found examined adjacent like pel indicating bits; and

when no pair of adjacent like pel indicating bits are found in any one of said bit groups, arbitrarily add or delete a pel indicating signal, respectively for enlargement or reduction of the image, from such no-pair bit groups.

4,598,284
SYSTEM FOR CHANGING COMMON CARD MODE DATA IN A CARD IMAGE DATA PROCESSING SYSTEM

Yoshiki Ikegami, Inagi, and Yasuaki Sato, Sagamihara, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 11, 1983, Ser. No. 540,681
Claims priority, application Japan, Oct. 11, 1982, 57-177773
Int. Cl.⁴ G09G *1/14*
U.S. Cl. 340—750 **2 Claims**



1. A system for changing common card mode data, where the common card mode includes a mode image and field definition information, for a plurality of card images, the system comprising:

a display unit;

means for inputting information;

memory means comprising:

a first memory section for storing card mode data belonging to a first card mode,

a second memory section for storing card data belonging to said first card mode,

a third memory section for storing card mode data belonging to a second card mode,

a fourth memory section for storing card data belonging to said second card mode, and

a fifth memory section, operatively connected to said display unit and said first and third memory sections, for storing data representing a correspondence between the field definition information of said first card mode data and said second card mode data;

means, operatively connected to said display unit and said memory means, for showing said correspondence between the field definition information by displaying said first card mode data, stored in said memory means, and said second card mode data, stored in said memory means, on said display unit; and

means, operatively connected to said memory means, for transferring all or part of said first card data stored in said second memory section of said memory means to said fourth memory section of said memory means in accordance with the data representing a correspondence between the field definition information stored in said memory means.

4,598,285

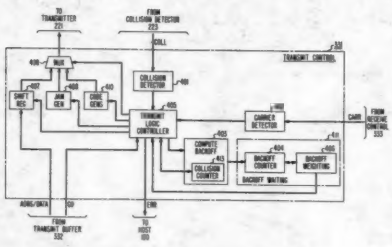
SCHEME FOR REDUCING TRANSMISSION DELAY FOLLOWING COLLISION OF TRANSMISSIONS IN COMMUNICATION NETWORKS

Joseph Hoshen, Naperville, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 27, 1983, Ser. No. 498,792

Int. Cl.[4] H04J *3/02;* **H04Q** *9/00*

U.S. Cl. 340—825.5 **20 Claims**



1. Method of handling interfering communications in a communication network comprising a communication medium and a plurality of stations connected to the medium for communication, each station having intrastation propagation delay of B and the medium having maximum interstation propagation delay of A, comprising the steps of:

detecting interfering communications;

monitoring the medium to detect when the medium becomes quiescent following detection of the interfering communications;

determining a backoff time period as a function of a time slot S wherein

$$B+2A \leq S < 2B+2A;$$

waiting for expiration of the backoff time period following the medium becoming quiescent; and

communicating following the expiration of the backoff time period.

4,598,286

METHOD AND APPARATUS FOR CONTROLLING DISTRIBUTED ELECTRICAL LOADS

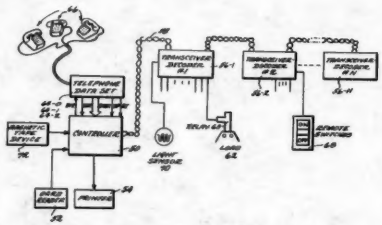
Edward B. Miller, West Warwick, R.I., and Charles W. Eichelberger, Schenectady, N.Y., assignors to General Electric Company, Bridgeport, Conn.

Division of Ser. No. 325,031, Nov. 25, 1981, Pat. No. 4,535,332, which is a division of Ser. No. 89,478, Oct. 30, 1979, abandoned.

This application May 25, 1984, Ser. No. 614,141

Int. Cl.[4] H04Q *9/00*

U.S. Cl. 340—825.06 **4 Claims**



1. In a programmable system for controlling distributed electrical loads including plural relays, each connected to control a respectively corresponding one of said plural distributed electrical loads, a programmable central controller connected to provide data signals for controlling selected ones of said distributed electrical loads, a method for controlling said distributed loads by communication between a transceiver decoder and said programmable central controller comprising the steps of:

receiving at a transceiver decoder load control signals from said central controller for controlling particular ones of said relays,

decoding said load control signals and determining the particular relays to be controlled in respect thereto,

pulsing relay drivers associated with said particular relays,

indicating which of said relays drivers associated with particular relays have been pulsed,

signalling said central controller, in response to an interrogating signal received therefrom, and indicating which of said relay drivers associated with particular relays have been actuated,

determining an error condition if the interrogated transceiver decoder fails to respond,

retransmitting an appropriate control instruction to the interrogated transceiver decoder if it responds with an incorrect status, and

self-clearing the error condition if a response is eventually received.

4,598,287

REMOTE CONTROL APPARATUS

Yoshio Osakabe, Yokohama, and Tadao Suzuki, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 23, 1983, Ser. No. 497,071

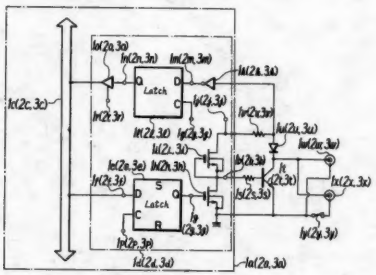
Claims priority, application Japan, May 25, 1982, 57-88402

Int. Cl.[4] G05B *19/02*

U.S. Cl. 340—825.24 **6 Claims**

1. A remote control apparatus comprising: a microprocessor (**1***a*) for producing a first remote control signal (**1***f*) at its data bus-line (**1***c*); a first latch circuit (**1***o*) which receives said first remote control signal from the data bus-line of said microprocessor; a first buffer circuit (**1***h*, **1***l*) connected to the output of said first latch circuit and receiving said first remote control signal; a common input/output terminal (**1***w*, **1***x*); switching means connected between said common input/output terminal and a reference point and controlled by the output of said first buffer circuit so as to produce an output signal corresponding

to said first remote control signal at said common input/output terminal (**1***x*); means (**2***a*) for transmitting a second remote control signal to said common input/output terminal (**1***w*); a DC voltage source (**1***j*) connected to said first buffer circuit and said common input/output terminal through a load resistor (**1***v*) and diode means with the cathode of said diode means connected to said common input/output terminal and its anode



connected to said load resistor (**1***v*); a second buffer circuit (**1***k*) having input and output terminals the input terminal of which is connected to the anode of said diode means and said load resistor; and a second latch circuit (**1***l*) connected to the output terminal of said second buffer circuit so as to receive an output corresponding to said second remote control signal therefrom and to transfer the same to the data bus-line of said microprocessor.

4,598,288

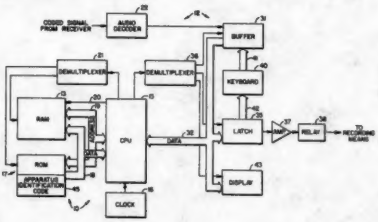
APPARATUS FOR CONTROLLING THE RECEPTION OF TRANSMITTED PROGRAMS

Charles J. Yarbrough, Kenwood; Alan F. Strachan, Santa Rosa, and Joe Weisman, Kenwood, all of Calif., assignors to Codart, Inc., Calif.

Continuation of Ser. No. 274,932, Jun. 18, 1981, abandoned, which is a continuation-in-part of Ser. No. 30,436, Apr. 16, 1979, Pat. No. 4,305,101. This application Dec. 20, 1983, Ser. No. 563,878

Int. Cl.[4] **G11B** *15/18*

U.S. Cl. 340—825.34 **11 Claims**



1. Apparatus for use with receiving means for enabling the receiving of programs desired by a user and authorized by a program provider, a program provided by said provider being accompanied by a program signal including a transmitted program identification code identifying the program and indicative of restricted authorization to receive said program if the program has restricted authorization, said apparatus comprising:

signal-sensing means for sensing the transmitted program identification code in said program signal;

input means for inputting a purchased program identification code which is different from the transmitted program identification code if the program has restricted authorization;

storage means for storing the input program identification code;

apparatus identification means for storing an apparatus identification code substantially uniquely indicative of the identity of the apparatus; and

logic means connected to said signal-sensing means to receive the transmitted program identification code and connected to said storage means to receive the input program identification code stored therein, the logic means including comparison means which operates if the transmitted program identification code indicates that the program has restricted authorization to transform at least one of the input or transmitted program identification codes based on the apparatus identification code in a manner substantially unique to the apparatus for comparison of the uniquely transformed code to the other code, said logic means providing an enabling signal to said receiving means only when the authorization codes, subsequent to the unique transformation of one of them if the program has restricted authorization, conjointly indicate the receiving is authorized.

4,598,289

CONTROL DEVICE FOR A SYNCHRO RECEIVER

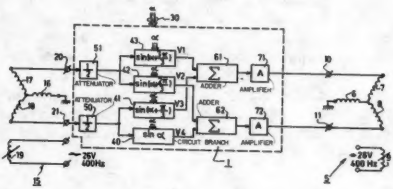
Guy F. M. Marin, Boulogne, and Serge Hethuin, Meudon, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 1, 1983, Ser. No. 510,092

Claims priority, application France, Jul. 2, 1982, 82 11640

Int. Cl.[4] **G09F** *13/36*

U.S. Cl. 340—870.34 **9 Claims**



1. A control device for a synchro receiver for data supplied by a synchro transmitter and a digital element, the said synchros each comprising three stator windings, the control device comprising: four circuit branches with inputs of the first and the second branches interconnected to receive a first voltage from a first stator winding of the synchro transmitter and with inputs of the third and the fourth branches interconnected to receive a second voltage from a second stator winding of the synchro, first and second adders, means connecting two inputs of the first adder to outputs of the first and the third branches, respectively, means connecting two inputs of the second adder to outputs of the second and the fourth branches, said first, second, third and fourth branches having a transfer function of the form sin ($\alpha+\phi$**1**), sin ($\alpha+\phi$**2**), sin ($\alpha+\phi$**3**), and sin ($\alpha+\phi$**4**), respectively, wherein α represents the data supplied by the digital element and ϕ**1**, ϕ**2**, ϕ**3**, ϕ**4** the different phase angles of the first, second, third, and fourth branches, respectively, and means for applying control voltages derived at outputs of the first and second adders to the stator windings of the synchro receiver.

4,598,290

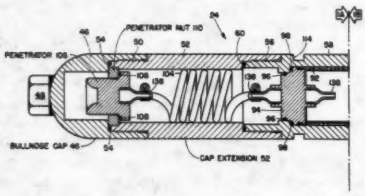
FIBER OPTIC PENETRATOR FOR OFFSHORE OIL WELL EXPLORATION AND PRODUCTION

Jerry C. Collins, Allen; Charles P. Warner; Jerry A. Henkener, both of San Antonio, and Rolf Glauser, Helotes, all of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 508,799, Jun. 29, 1983. This application Apr. 27, 1984, Ser. No. 604,695

Int. Cl.[4] H04B *13/02;* B23Q *5/00;* G02B *6/36*

U.S. Cl. 340—850 12 Claims



1. A fiber optic penetrator arrangement for an undersea wall structure of offshore oil well production apparatus, comprising:

a. a generally cylindrical housing;

b. a cofferdam associated with the undersea production apparatus and defining a generally cylindrical entrance port into which the penetrator is designed to be inserted and mounted;

c. a sealing means for sealing said penetrator relative to said entrance port after insertion of the penetrator therein;

d. an external bulkhead,

e. a second bulkhead positioned internally of said external bulkhead,

f. a compression spring normally retaining said second bulkhead in a sealed position with said penetrator, said compression spring being compressed between said second bulkhead and said external bulkhead,

g. a breakaway connection affixed to said external bulkhead for coupling an optical fiber transmission cable to said external bulkhead, such that if the transmission cable is snagged or pulled, the external bulkhead will sever along with the breakaway connection so that the penetrator is not pulled from the cofferdam entrance port, said second bulkhead being held in position by ambient water pressure to become the primary bulkhead after said external bulkhead is severed.

4,598,291

ELECTRICAL CONTROL TELEMETERING DEVICE

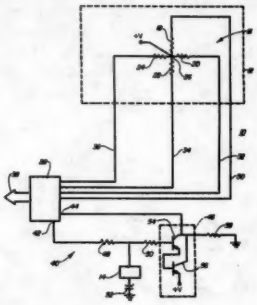
James L. Griffin, Carpentersville, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed May 7, 1984, Ser. No. 607,380

Int. Cl.[4] G08C *19/10*

U.S. Cl. 340—870.37 6 Claims

1. An electrical control device comprising resistive means for simulation of at least one axis; actuator means associated with said resistive means for effecting control indication, said actuator means having a capacitance to ground; processor means connected to said resistive means and receiving an output therefrom, said processor means responding to said output to produce a control signal and communicating said control signal to a responding device; and circuit means for indicating an occasion for updating a reference level of the control device; said circuit means being connected to said processor means and to said actuator means, said circuit means cooperating with said processor means to oscillate at a frequency, said frequency being proportional to said capacitance; said processor means responding to a specified variance of said frequency as an indication of said occasion by communicating a reference control signal to said responding device upon occurrence of said occasion and by establishing said reference



control signal as a reference level for subsequent of said control signals communicated to said responding device.

4,598,292

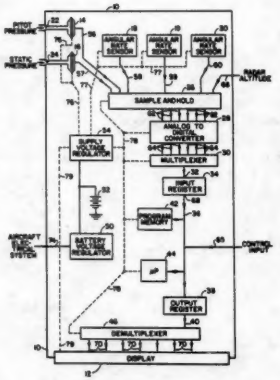
ELECTRONIC STANDBY FLIGHT INSTRUMENT

Vincent A. Devino, Hauppauge, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Dec. 23, 1983, Ser. No. 564,728

Int. Cl.[4] G01C *21/00, 23/00*

U.S. Cl. 340—973 4 Claims



1. A single unit standby flight instrument for displaying turn rate, altitude, airspeed, pitch, roll, and heading of an aircraft to a pilot of the aircraft, said aircraft having an instrument panel with manual flight instrumentation, said instrument comprising

sensor means for generating a plurality of sensor signals indicative of pitot pressure, static pressure, and angular displacement rates of the aircraft;

display means for outputting display signals in a desired format;

processor means for converting the sensor signals into a purality of display signals indicative of the turn rate, altitude, airspeed, pitch, roll and heading of the aircraft, said processor means comprising sampling means for periodically sampling said sensor signals, converter means for digitizing the sampled sensor signals, multiplexing means for applying the digitized sensor signals to an input bus in a predetermined input sequence, an input register responsive to the input bus and having a tri-state output for

applying said digitized sensor signals to a program bus, an output register responsive to the program bus for outputting said display signals in a multiplexed format according to a predetermined output sequence, a microprocessor for controlling data flow on the program bus and updating the output register in accordance with current values of said digitized sensor signals in the input register, and demultiplexed means responsive to said output register for routing said display signals in accordance with the predetermined output sequence to appropriate inputs of said display means;

power supply means for supplying electric power to said sensor means, processor means, and display means; and

a single instrument housing mounted within view of the pilot and enclosing said sensor means, processor means, and power supply means, said display means being mounted on said housing so as to be visible to the pilot, said housing being rigidly mounted to the aircraft and located in an area on the instrument panel close to the standard flight instrumentation and within the vision limits of the pilot, thereby providing said pilot with an emergency source of airspeed, altitude, heading, attitude, and rate of turn information in a single compact unit.

4,598,293

RADAR OR SONAR DETECTION SYSTEM

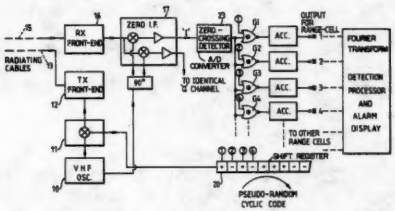
Andrew C. Wong, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 438,217, Nov. 1, 1982, abandoned. This application May 24, 1985, Ser. No. 737,905

Claims priority, application United Kingdom, Nov. 12, 1981, 8134090

Int. Cl.⁴ G01S *13/00, 7/28, 9/68*

U.S. Cl. 343—17.2 R **2 Claims**



1. In a radar or sonar system, a combination comprising a transmitter including an encoder for modulating a carrier prior to transmitting the same into the system with a cyclic pulse code sequence which is cycled through a predetermined number of bit positions at a frequency equal to the pulse repetition frequency, and a receiver including a 1-bit analog-to-digital converter comprising a zero-crossing detector for digitizing incoming signals received from respective range cells of the system in response to the effect of the modulated carrier thereat, and a plurality of 1-bit correlators each respectively supplied with the instantaneous value of the digitized signal from said 1-bit analog to digital converter and with the value of the bit of the code sequence then encountered at a predetermined one of said bit positions which is different for each of said correlators and corresponds to the respective range ceil, wherein each 1-bit correlator comprises an exclusive-OR gate, said correlators being collectively operative for simultaneously correlating each successive bit of the digitized signal with the values of the respective bits in each expected position of the received code sequence, and a plurality of accumulators, each accumulator comprising an up-down counter connected to an output of one of said respective 1-bit correlators to accumulate the output thereof for a predetermined number of RF pulses.

4,598,294

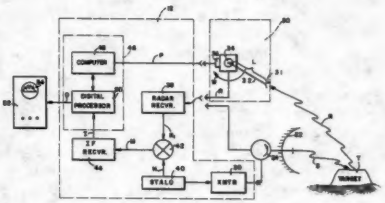
TEST SIGNAL GENERATOR FOR COHERENT AIR-TO-GROUND RADARS

Raymond A. Guhse, Millersville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 23, 1983, Ser. No. 564,864

Int. Cl.⁴ G01S *7/40*

U.S. Cl. 343—17.7 **4 Claims**



1. Apparatus for ground testing of air-to-ground microwave doppler radar systems, comprising:

a stationary target;

a stationary radar transmitter remote from said target for propagating microwave signals toward said target;

antenna means remote from said target and said transmitter for receiving the microwave signals reflected from said target, said antenna means including a rotatable vertical shaft, a motor drivingly connected to said shaft for rotation thereof, first and second arms extending in opposite diections from the top of said shaft, a microwave antenna positioned at the free end of said first arm, a counterbalancing weight at the free end of said second arm, waveguide means extending from said antenna through said first arm and said shaft to the base of said shaft;

sensor means operatively connected to said waveguide means at the base of said shaft for providing signals indicative of the angular position of said antenna; and

electronic means receiving the microwave signals from said waveguide means and angular position signals from said sensor means, for providing a display signal of the realistic amplitude and doppler history of the target-reflected microwave signals.

4,598,295

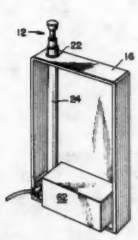
REPLACEABLE RADIO ANTENNA

Harold R. Murphy, Herkimer, N.Y., assignor to General Electric Company, Portsmouth, Va.

Filed Sep. 7, 1984, Ser. No. 648,648

Int. Cl.⁴ H01Q *1/24*

U.S. Cl. 343—702 **10 Claims**



1. In a radio product, a replaceable antenna assembly comprising:

an elongated antenna having a base portion at one end thereof, said base portion including first fastening means,

a housing defining first and second openings therein an interior space extending therebetween for receiving at least said base portion of said antenna, said first opening sized to permit said base portion of said antenna to be selectively inserted into and retracted from said interior space from the exterior of said housing,

receiver circuit means including an electrical connector,

said housing including means forming a slot therein and said electrical connector comprising a conductive metal plate positioned within said slot, said electrical connector having angled projections thereon engaging a wall of said slot to prevent removal of said plate from said slot thereby securing said electrical connector within said housing in a fixed position in which electrical contact is provided between said connector and said base portion of said antenna when said base portion is positioned within said interior space, and

second fastening-means including a first portion for engaging the exterior of said housing and a second portion for extending through said second opening, said first portion including operating means accessible from the exterior of said housing for selectively causing said second portion to either engage said first fastening means to lock said base portion within said interior space or disengage said first fastening means to release said base portion,

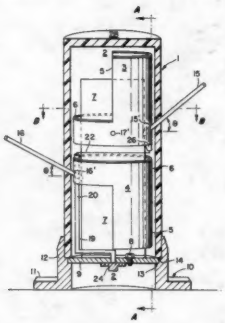
whereby said antenna may be removed and replaced without requiring disassembly and reassembly of said housing.

4,598,296

DIPOLE ANTENNA SYSTEM WITH OVERHEAD COVERAGE HAVING EQUIDIRECTIONAL-LINEAR POLARIZATION

Ivan Faigen, Wayland; Michael Eovine, Woburn, and David Thombs, Chelmsford, all of Mass., assignors to Chu Associates, Inc., Littleton, Mass.

Filed Jul. 31, 1984, Ser. No. 636,166
Int. Cl.[4] H01Q *9/16*
U.S. Cl. 343—730 **8 Claims**



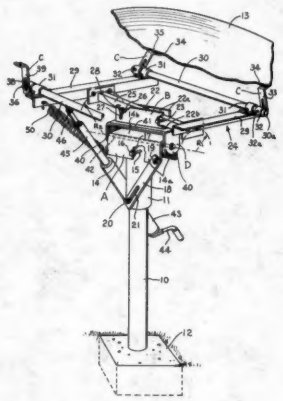
1. Antenna apparatus comprising a vertically oriented cylindrical dipole antenna including a pair of antenna elements that are spaced apart vertically at adjacent ends, and a plurality of supplemental conductors connected to said dipole antenna at points near said adjacent ends of said elements and successively spaced substantially 90 degrees apart circumferentially of the dipole antenna, one pair of said supplemental conductors being connected to one of said elements and another pair of said supplemental conductors being connected to the other of said elements, each of said supplemental conductors extending outwardly from said dipole antenna and upwardly at an acute angle with respect to horizontal.

4,598,297

MOUNTING APPARATUS FOR SATELLITE DISH ANTENNAS

Joel W. Hawkins, P.O. Box 3867, Greenville, S.C. 29608

Filed Oct. 21, 1983, Ser. No. 544,285
Int. Cl.[4] H01Q *3/08*
U.S. Cl. 343—882 **5 Claims**



1. Mounting apparatus having a satellite dish antenna having a tiltable frame comprising:

a first support pivotably mounted about a first pivot axis;

a second support pivotally mounted on said first support about a second axis orthogonal to said first axis;

means mounting said tiltable frame and said dish antenna on said second support around a third pivot axis generally parallel to said first pivot axis;

locking means for locking said tiltable frame with respect to said second support; and

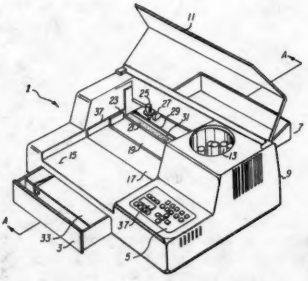
means for adjusting said tiltable frame around said second axis.

4,598,298

PLOTTER HAVING AUTOMATIC SHEET FEEDER

Jeffery W. Groenke, and Wallace S. Halliday, both of San Diego, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 9, 1984, Ser. No. 609,065
Int. Cl.[4] G01D *15/28*
U.S. Cl. 346—1.1 **6 Claims**



1. A plotter for writing on a sheet of recording medium, comprising:

a surface for supporting the sheet in an X-Y plane;

carriage means, above the surface and movable in the Y-axis, for carrying a pen;
an alignment edge, parallel to the X-axis and located at an edge of the surface for contacting an edge of the sheet;
first drive means, located within the surface and in proximity to the alignment edge, for selectably gripping the sheet and imparting to the sheet a single force substantially parallel to the X-axis and thereby urging the sheet along the X-axis in a forward or reverse direction;
second drive means, located within the surface and distant from the alignment edge, for selectably gripping the sheet in conjunction with the first drive means and imparting to the sheet a single force substantially parallel to the X-axis and thereby urging the sheet along the X-axis in a forward or reverse direction; and
lifting means, coupled to the first and second drive means, for causing the first drive means to grip the sheet either alone or in conjunction with the second drive means;
such that the sheet moves substantially parallel to the X-axis when both the first and second drive means grip and urge the sheet and such that the sheet moves substantially parallel to the X-axis and also tends to rotate about the first drive means and to align against the alignment edge when the first drive means grips and urges the sheet and the second drive means is disengaged from the sheet.

4,598,299

DEFLECTION CONTROL INK JET PRINTING APPARATUS

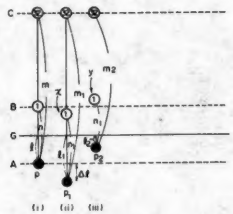
Takahisa Koike; Takao Fukazawa, both of Tokyo; Kazumi Ishima, Kashiwa; Toshiharu Murai; Tadashi Itoh, both of Yokohama; Toshifumi Kato, Tokyo, and Koichiro Jinnai, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 9, 1983, Ser. No. 550,289

Claims priority, application Japan, Nov. 11, 1982, 57-197941; Nov. 11, 1982, 57-197942; Nov. 11, 1982, 57-197943

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—75 **11 Claims**



1. A deflection control ink jet recording apparatus comprising:
an ink ejection head having an ink ejection nozzle and a vibrator for applying pressure vibration of a predetermined period to ink which is communicated to said nozzle;
a pump for supplying ink under pressure to said ink ejection head;
a charging electrode for applying a charging electric field to ink ejected from the nozzle;
a deflection electrode for applying a deflecting electric field to charged ink drops;
a gutter for capturing uncharged nonprinting ink drops;
charge detecting electrode means for detecting low deflection ink drops which miss an upper edge of said gutter and ink drops higher in deflection than said drops;
a charge detector circuit connected to said charge detecting electrode means for generating an output signal which indicates detection/nondetection of charged ink drops; and
an electronic control unit for reading the detection/nondetection of charged ink drops indicated by the charge detecting electrode means and the charge detector circuit, adjusting a charge voltage amplification gain to detect a charge voltage amplification gain in the event of a change of the detection and the nondetection of ink drops from one to the other, adjusting a charge voltage code to detect a charge voltage code in the event of a change of the detection and the nondetection of ink drops from one to the other, and computing in accordance with a predetermined function a charge voltage amplification gain and a charge voltage code for a printout operation based on the detected gain and the detected charge voltage code.

4,598,300

IMAGE BUILDING APPARATUS

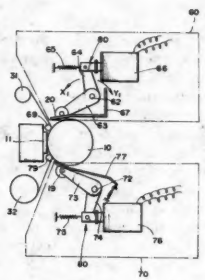
Ken'ichi Ono, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 17, 1985, Ser. No. 735,434

Claims priority, application Japan, May 19, 1984, 59-100262; May 21, 1984, 59-102304; May 30, 1984, 59-112130

Int. Cl.[4] G01D *15/10*

U.S. Cl. 346—76 PH **18 Claims**



1. In an image building apparatus for building color image on printing medium by transfering thereto a plurality of coloring agents on transfer material by means of a printing head while reciprocably displacing the printing medium by rotation of a platen, the improvement comprising;
a platen for forwardly and backwardly conveying the printing medium by the rotation of said platen while winding it partially about said platen,
a printing head which comes in contact with the platen with the transfer material and the printing medium interposed therebetween so as to transfer the plurality of coloring agents on the transfer material onto the printing medium,
first and second thrust roller mechanisms including first and second thrust rollers disposed upstream and downstream of said printing head as seen in the direction of conveying of the printing medium, said first and second thrust rollers moving toward the platen so as to secure the contact of the printing medium with the surface of the platen, and
control means for controlling said first and second thrust roller mechanisms so as to allow the thrust rollers to come in contact with the platen when the reciprocably conveyed printing medium is existent between the thrust rollers and the platen.

4,598,301

THERMAL PRINTER

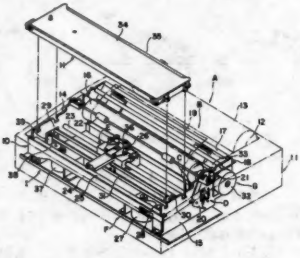
Masayuki Suzaki, Fujisawa; Shoji Nishiwaki, Machida; Toshitaka Hayashima, Hatano; Shigeyuki Araki, Komae, and Masanori Momose, Hiratsuka, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 29, 1984, Ser. No. 594,682

Claims priority, application Japan, Mar. 31, 1983, 58-55751; Mar. 31, 1983, 58-55752; Mar. 31, 1983, 58-55753; Apr. 28, 1983, 58-75085

Int. Cl.[4] B41J *33/14*

U.S. Cl. 346—76 PH 24 Claims



1. A thermal printer for thermally printing information on a recording medium, said printer comprising:

a platen for guiding the advancement of said recording medium;

a thermal printhead;

a carriage mounting thereon said thermal printhead, said carriage being movable along a predetermined path extending in parallel with a longitudinal axis of said platen in a reciprocating manner;

means for pressing said printhead against said platen while said carriage is moving in a first direction along said predetermined path, in which printing is effected, and keeping said printhead separated away from said platen while moving in a second direction, in which no printing is effected and which is opposite to said first direction along said predetermined path;

a detachably mountable cassette containing therein heat-sensitive ink ribbon which partly extends outside of said cassette from a supply port to a take-up port defined in said cassette, said cassette being substantially elongated and its longitudinal direction being in parallel with said predetermined path when mounted;

a ribbon driving mechanism mounted in said printer; and

advancing means for advancing and controlling feeding of said ribbon from said supply port to said take-up port in association with the motion of said carriage in said second direction, said advancing means being mounted in said cassette and being operatively coupled to the ribbon driving mechanism of said printer when the cassette is mounted in position.

4,598,302

TRANSFER TYPE RECORDING APPARATUS

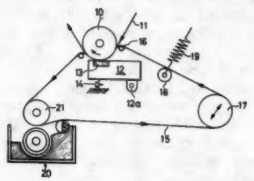
Ron Swidler, Palo Alto, and Dale Ploeger, Newark, both of Calif., assignors to Kyocera Corporation, Japan

Filed Jun. 20, 1985, Ser. No. 747,063

Int. Cl.[4] G01D *15/10*; B41J *31/16*

U.S. Cl. 346—76 PH 8 Claims

1. A transfer type recording apparatus in which, after transferring-material borne on a support is transferred onto a recording medium by transfer forcing means, the support from which the transferring material has been partially removed by printing is coated with the transferring-material again, the apparatus comprising: transferring-material removing means for removing transferring-material applied to said support while maintaining said transferring-material molten, said transferring-material removing means removing transferring-materials applied to two side margins of said support, thereby



forming regions on both sides of a transferring-material coated surface on said support which are not coated with transferring-material.

4,598,303

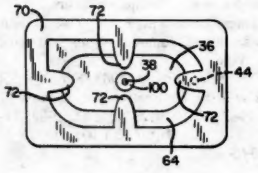
METHOD AND APPARATUS FOR OPERATING AN INK JET HEAD OF AN INK JET PRINTER

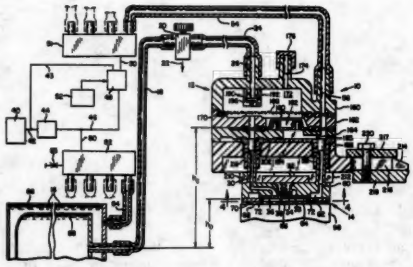
Thomas E. Peekema, Beaverton, and James O. Beehler, Canby, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Nov. 28, 1984, Ser. No. 675,687

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—140 R 19 Claims





13. An apparatus for operating an ink jet print head of an ink jet printer, the ink jet print head having an ink supply passageway through which pressurized ink from an ink cartridge is delivered to an ink chamber within the head and an air supply passageway through which pressurized air from an air supply is delivered to an air chamber within the ink jet print head, the ink chamber communicating through an ink droplet forming orifice with the air chamber, the air chamber communicating through a main ink droplet generating orifice with the exterior of the ink jet print head, ink droplets being generated within the ink chamber and passing through the internal orifice and air chamber to the main orifice, and pressurized air entering the air chamber assisting in directing the ink droplets outwardly from the main orifice and towards the printing medium

to print a copy of an image on such medium, the apparatus comprising:

ink supply conduit means for delivering ink under pressure from the ink cartridge to the ink chamber;

air supply conduit means for delivering pressurized air from the air supply to the air chamber; and

air flow interrupter means for selectively interrupting the supply of air to the air chamber so as to enable sufficient ink to flow from the ink chamber to the air chamber to maintain the quantity, shape and position of the ink remaining within the air chamber.

4,598,304
THIN FILM DEVICES OF SILICON

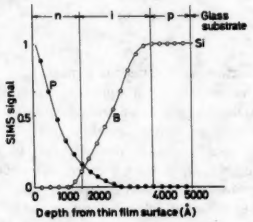
Kazunobu Tanaka; Akihisa Matsuda, both of Ibaraki, and Toshihiko Yoshida, Tokyo, all of Japan, assignors to Agency of Industrial Science & Technology and Toa Nenryo Kogya, K.K., both of Tokyo, Japan

Continuation of Ser. No. 633,751, Jul. 23, 1984, abandoned, which is a division of Ser. No. 394,074, Jul. 1, 1982, Pat. No. 4,490,208. This application Oct. 23, 1985, Ser. No. 790,781

Claims priority, application Japan, Jul. 8, 1981, 56-105703; Jul. 8, 1981, 56-105704

Int. Cl.⁴ H01L *49/02, 31/06*

U.S. Cl. 357—4 **15 Claims**



1. A thin film silicon semiconductor device comprising a substrate and a thin film of silicon, said substrate supporting said thin film, said thin film being doped with a dopant impurity element, the concentration of the dopant impurity element being substantially zero for a predetermined thickness beneath a boundary of said thin film and increasing substantially linearly from the zero concentration beneath the boundary to a substantially constant concentration within said thin film.

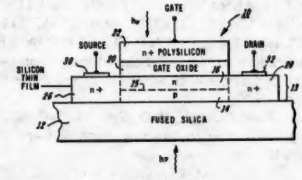
4,598,305
DEPLETION MODE THIN FILM SEMICONDUCTOR PHOTODETECTORS

Anne Chiang, Cupertino, and Noble M. Johnson, Menlo Park, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 18, 1984, Ser. No. 621,340

Int. Cl.⁴ H01L *29/78, 27/12*

U.S. Cl. 357—23.7 **30 Claims**



1. A depletion mode thin film semiconductor photodetector comprising a crystalline silicon thin film on an insulating substrate with a source region, a drain region and a thin film light sensing channel region formed therebetween, a gate oxide formed over said channel region, a gate electrode formed on said gate oxide, a p-n junction located parallel to the surface of said substrate and within said thin film and creating a space charge separation region therein, the lower portion of said channel region being a first conductivity type region extending to said substrate and the upper portion of said channel region being a second conductivity type region extending to said gate oxide, said source and drain regions functioning as ohmic contacts with said upper portion channel region, said upper portion channel region forming a channel for majority carrier conduction, said lower portion channel region being maintained at floating potential for minority carrier collection as space charge therein, said channel region functioning as a fully depleted channel when said photodetector is operated in its OFF state providing for high dynamic range and large photocurrent operation.

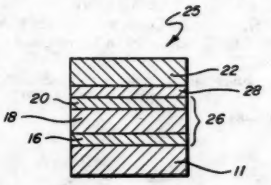
4,598,306
BARRIER LAYER FOR PHOTOVOLTAIC DEVICES

Prem Nath, Rochester, and Masatsugu Izu, Birmingham, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Jul. 28, 1983, Ser. No. 518,184

Int. Cl.⁴ H01L *27/14*

U.S. Cl. 357—30 **20 Claims**



1. In a semiconductor device comprising a first electrode; an active semiconductor body atop the first electrode, said semiconductor body including at least one triad of semiconductor layers, said triad comprised of two oppositely doped semiconductor layers having a layer of intrinsic semiconductor material disposed therebetween, said body adapted to provide for the flow of electrical current in response to the absorption of light energy incident thereon; a second electrode atop the semiconductor body; and at least one defect region which is capable of providing a low resistance shunt path for the flow of electrical current between the electrodes; the improvement comprising:

a continuous transparent barrier layer, formed of a material having an electrical resistivity greater than that of the electrodes, operatively disposed between the semiconductor body and one of the electrodes for decreasing the flow of electrical current through said at least one defect region of said semiconductor device.

4,598,307
INTEGRATED CIRCUIT DEVICE HAVING PACKAGE WITH BYPASS CAPACITOR

Tetsushi Wakabayashi, Yokohama, and Kiyoshi Muratake, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 7, 1983, Ser. No. 530,046

Claims priority, application Japan, Sep. 22, 1982, 57-165432

Int. Cl.⁴ H01L *23/16, 23/48*

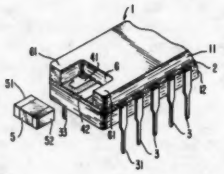
U.S. Cl. 357—75 **13 Claims**

1. An integrated circuit device, comprising:

an integrated circuit die;

a lead base made of ceramic for mounting said integrated circuit die;

a lid made of ceramic, and having an opening in a marginal region thereof, said lid being bonded to said lead base such that said die is sealed between said lead base and said lid in a region other than said marginal region;



a plurality of metal leads sandwiched between said lead base and said lid, a pair of said leads having portions thereof that are exposed to said opening in the lid; and

a chip capacitor positioned within said opening in the lid having terminals that are soldered to said portions of said leads that are exposed to said opening.

4,598,308

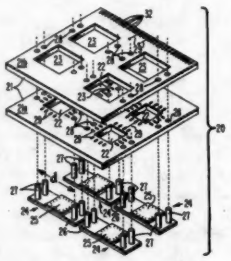
EASILY REPAIRABLE, LOW COST, HIGH SPEED ELECTROMECHANICAL ASSEMBLY OF INTEGRATED CIRCUIT DIE

Christopher D. James, La Costa, and Norman E. McNeal, Carlsbad, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Apr. 2, 1984, Ser. No. 596,053

Int. Cl.[4] H01L *23/40, 23/50*

U.S. Cl. 357—81 **8 Claims**



1. An electromechanical assembly of integrated circuit die, comprising:

a plurality of independent subassemblies each of which consists of just one of said die having its backside attached directly to a single plate of a single type of material and a plurality of posts which extend perpendicular from said plate around said one die;

a substrate having a plurality of spaced apart holes each of which is only slightly larger than a single die and having several smaller bores around each of said holes;

said subassemblies being arranged such that each die lies in a respective hole and the posts of each subassembly are fitted into the bores around said respective holes;

said plate of each subassembly having a single thermal expansion coefficient which is essentially the same as the expansion coefficient of said die and substantially different than the expansion coefficient of said substrate;

said posts in each subassembly being spaced by a distance which is no more than slightly larger than a single die; and

said substrate having conductors which are connected by discrete bonding wires to the frontside of said die to carry signals thereto, and having another conductor connected to a respective post on each subassembly to carry a bias voltage to the backside of said die.

4,598,309

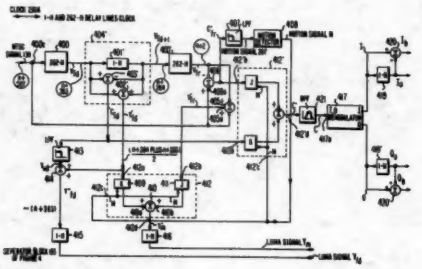
TELEVISION RECEIVER THAT INCLUDES A FRAME STORE USING NON-INTERLACED SCANNING FORMAT WITH MOTION COMPENSATION

Robert F. Casey, Middlesex County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed May 29, 1984, Ser. No. 614,668

Int. Cl.[4] H04N *7/01*

U.S. Cl. 358—11 **10 Claims**



1. A television apparatus for generating from an incoming composite color television signal first and second luminance output signals that are capable of providing picture information for display in a first plurality and in a different second plurality of display lines, respectively, of a non-interlaced television display, to form a picture frame, comprising:

a source of said incoming composite color television signal;

a delay element coupled to said source for delaying said incoming television signal by substantially one field period and by one frame period, respectively, to produce field and frame delayed television signals, respectively;

first means for adding said incoming television signal and said frame delayed television signal to produce a first frame comb filtered luminance video signal containing a luminance component derived from said incoming and frame delayed television signals;

second means for adding adjacent lines of said field delayed television signal for producing a second luminance video signal containing a luminance component derived from said field delayed television signal;

third means for combining said first and second luminance video signals to produce said first luminance output signal; and

fourth means responsive to said second luminance video signal for generating said second luminance output signal therefrom.

4,598,310

CIRCUIT ARRANGEMENT FOR OBTAINING A PHASE-SENSITIVE CONTROL QUANTITY, IN PARTICULAR IN A COLOR TELEVISION RECEIVER

Gerd Brand, Didderse, and Wilhelm Möring, Brunswick, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 28, 1983, Ser. No. 546,685

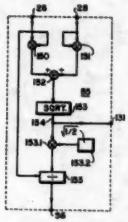
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1982, 3239933

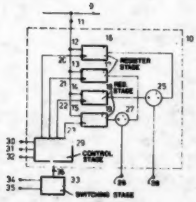
Int. Cl.[4] H04N *9/45*

U.S. Cl. 358—19 **20 Claims**

1. A circuit arrangement in a color television receiver for obtaining a phase-sensitive control quantity which depends on the phase shift of a color burst signal, having an amplitude

factor (A), with respect to a reference signal, preferably of approximately the same frequency, which is phase-locked to a clock signal with which the amplitude values of the color burst signal are sampled and whose frequency is the 4n-fold of the frequency of the reference signal, in which n is an integer of the series 1, 2, . . . and the keying occurs in such manner that a first sampled difference signal (X) and a second sampled difference signal (Y), shifted by a quarter of a cycle of the color burst signal, are obtained, wherein said sampled difference signals are proportional to the amplitude factor (A) of the color burst signal and which depend on the phase angle (α) of the color burst signal with respect to a point of time determined by the reference signal according to an angular function, said sampled difference signal (Y) being the difference between a third and a first of said samples while said sampled difference





signal (X) being the difference between a fourth and a second of said samples, said circuit arrangement comprising a conversion stage in which the sampled difference signals (X and Y) are squared and the root is extracted from their sum in such a manner that the amplitude factor (A) is obtained, and in which furthermore at least a phase-sensitive control quantity, which is dependent on the phase angle (α) and is at least substantially independent of the amplitude factor, is obtained for controlling said reference signal, characterized in that the conversion stage comprises in particular logic circuit elements in which at least one of the sampled difference signals is divided by the amplitude factor (A) in such manner that at least one phase-sensitive control quantity is obtained which consists substantially of sin- and cos-members of the phase angle (α) which is at least substantially independent of the amplitude factor.

4,598,311

LASER SURGICAL OPERATING METHOD AND APPARATUS

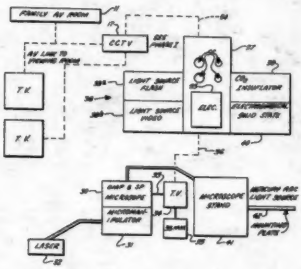
Joseph H. Bellina, 3439 Kabel Dr., New Orleans, La. 70114

Filed Apr. 11, 1984, Ser. No. 598,993
Int. Cl.[4] H04N *7/18*
U.S. Cl. 358—93 **10 Claims**

1. A system for microsurgical operation using lasers comprising:

a. A laser microscope system having a housing which carries optical means for viewing an operative field image which is enlarged by the microscope and laser means for selectively concentrating a laser beam on the operative field;

b. multiple operating room video cameras each generating a video signal and allowing simultaneous or selective viewing of the enlarged operative field image or of a normal operative field, or of a gross view of the operating room area so that surgical assistants selected and persons not in



the operating room can view the operative procedure while the laser surgeon is operating, in either the enlarged or normal field image; and

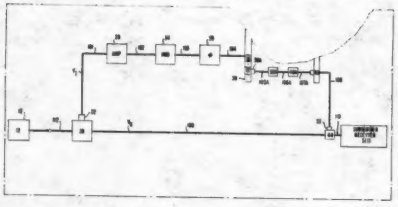
c. one or more video monitors interfaced with the multiple cameras for selectively displaying either the normal or enlarged images of the operative field in the operating room and in remote locations.

4,598,312

SECURE VIDEO DISTRIBUTION SYSTEMS

Robert G. Geissler, Westfield, and Carmine D'Elio, Morganville, both of N.J., assignors to Ortech Electronics Inc., Edison, N.J.

Filed Mar. 27, 1984, Ser. No. 593,975
Int. Cl.[4] H04K *1/02*; H04N *7/167*
U.S. Cl. 358—118 **34 Claims**



1. Secure cable television distribution apparatus for regulating access to channel information at a subscriber station, comprising:

means for receiving said channel information and for applying said channel information to a subscriber station;

means for obtaining signal information representing at least one predetermined channel signal in said channel information;

means for inserting a phase shift substantially equal to 180 degrees into said signal information; and

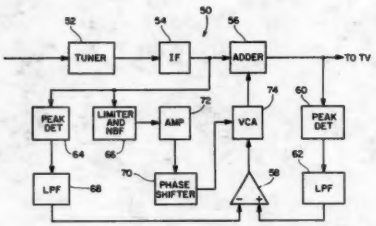
means for selectively combining said phase-shifted signal information and said channel information applied to said subscriber station to selectively defeat access to said at least one predetermined channel signal at said subscriber station.

4,598,313

TELEVISION SIGNAL SCRAMBLING SYSTEM

Melvin C. Hendrickson, Elmhurst, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Oct. 31, 1984, Ser. No. 666,852
Int. Cl.[4] H04N 7/167
U.S. Cl. 358—124 9 Claims



1. A television signal transmission system comprising:

means for transmitting an encoded television signal comprising an inverted video component amplitude modulating an RF carrier to a selected percentage of modulation, said encoded television signal further comprising inverted reference black and white level components;

means for receiving the transmitted signal;

means for generating a decoding signal equal in frequency to and 180 degrees out of phase with said RF carrier; and

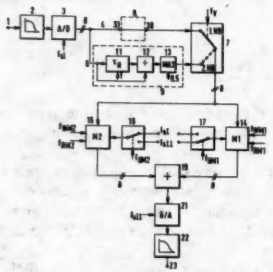
means responsive to the difference between the inverted reference white level component and the reinverted reference black level component for combining said decoding signal with said received signal so as to develop a decoded RF television signal characterized by said selected percentage of modulation.

4,598,314

METHOD AND APPARATUS FOR CONVERTING A VIDEO SIGNAL TO A CORRESPONDING SIGNAL OF LOWER LINE COUNT

Ulrich Reimers, Ober-Ramstadt, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 3, 1984, Ser. No. 576,613
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1983, 3304030
Int. Cl.[4] H04N 7/01
U.S. Cl. 358—140 8 Claims



4. Apparatus for converting a video signal of relatively high line count and having a frame rate and interlace scanning of two fields in each frame into a video signal of lower line count, of about half of said relatively high line count, while maintaining said frame rate and interlace scanning comprising:

means for digitizing the video signal of the relatively high line count at a first sample rate (f_{sI});

first and second digital storage units (14, 16);

first switch means for supplying a first field of each frame of video signals digitized by said digitizing means to said first and second storage units (14,16), said first field not necessarily being the first in time sequence of said video signal of relatively high line count;

means for writing, line by line, television lines of said video signals supplied from said first switch means, alternately into said first and second storage units in a regular manner reducing the line count of said first fields by about half;

line interpolation means connected between said digitizing means and said first switch means in a manner suitable for supplying to the output of said first switch means television lines obtained by line interpolation processing of the television lines of the second field of each frame of the signals digitized by said digitizing means,

said first switch means being also constituted for supplying said interpolation-processed lines alternately line by line to said first and second storage means under control by said writing means;

means for reading out, at a standard rate of readout, in field by field alternation, the television line contents of said first and second storage units, and means for combining into a single output the signals read out from said first and second storage units, said standard rate of read-out corresponding to a standard digital TV sampling rate; and

means for controlling said digitizing means so as to maintain a digital signal sample rate and thereby a sample writing in rate of said writing means in accordance with the following relation:

$$f_{sI} = \frac{N}{\tau H\ actI \cdot \frac{nz_{actII}}{nz_I - nz_{AVI}} \cdot M}$$

wherein:

f_{sI}=video signal sampling rate used to digitize

$\tau H\ actI$=active line duration

nz_I=number of lines

nz_{AVI}=number of lines in the vertical blanking interval for the video signal with the higher line count (I)

N=number of active sample values per line

nz_{actII}=number of active lines for the video signal with the lower line count

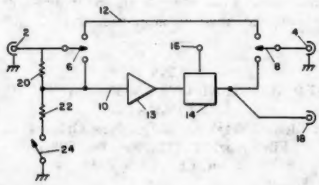
M=conversion factor for reducing the number of lines.

4,598,315

SIGNAL PROCESSING APPARATUS AND METHOD OF OPERATING SUCH APPARATUS

Bruce J. Penney, and Michael D. Nakamura, both of Portland, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 17, 1983, Ser. No. 476,182
Int. Cl.[4] H04N 5/04
U.S. Cl. 358—149 6 Claims



2. Signal processing apparatus comprising an input terminal to which a signal may be applied, first switch means connected to said input terminal, second switch means, an output terminal

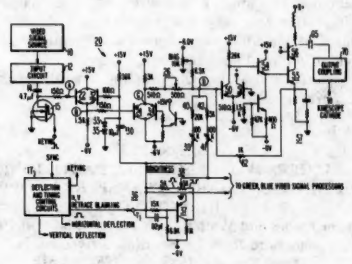
connected to said second switch means, and means defining at least first and second signal channels extending in parallel from said first switch means to said second switch means, said first and second switch means being operable to connect a selected one of said signal channels between the input terminal and the output terminal, only said first signal channel including signal processing means and having an auxiliary output terminal, and the apparatus further comprising means for connecting the input terminal to the signal processing means even when said second channel is selected for connecting the input terminal to the output terminal so that a signal applied to the input terminal is applied to the signal processing means as well as to the output terminal when said second channel is selected, whereby the signal processing means can be exercised and the output of the signal processing means can be monitored at said auxiliary output terminal while said second channel is utilized for transmitting a signal from the input terminal to the output terminal.

4,598,316

BRIGHTNESS CONTROL NETWORK IN A VIDEO SIGNAL PROCESSOR WITH AC COUPLED OUTPUT STAGES

Robert L. Rogers, III, Lancaster, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed May 31, 1983, Ser. No. 532,333
Int. Cl.[4] H04N *5/57, 9/77*
U.S. Cl. 358—168 **9 Claims**



1. A system including a video channel for processing a video signal comprising image blanking intervals, an image display device having an input intensity control electrode for receiving a video output signal from said video channel, and apparatus included in said video channel for controlling the brightness of a displayed image, said apparatus comprising:

signal conditioning means for modifying the amplitude characteristic of said video signal normally present during said image blanking intervals, to establish a modified video signal with a prescribed reference level during said image blanking intervals;

means for adding a pulse component having a peak amplitude in a black image direction to said modified video signal during said blanking intervals; and

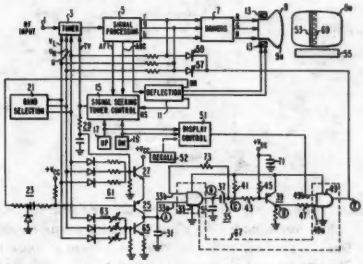
control means for adjusting the magnitude of said pulse component to control the brightness of a displayed image in accordance with the setting of said control means, to thereby produce said video output signal with an image brightness representative pulse component.

4,598,317

RAMP COMPARATOR ARRANGEMENT USEFUL IN AN ON-SCREEN CHANNEL INDICATOR SYSTEM OF A TELEVISION RECEIVER

Ju M. Yu, Taoyuan, Taiwan, assignor to RCA Corporation, Princeton, N.J.

Filed Jan. 23, 1984, Ser. No. 573,227
Int. Cl.[4] H04N *5/50*
U.S. Cl. 358—192.1 **6 Claims**



1. In a television receiver including tuner means controlled in response to a tuning signal generated by a tuning control unit for tuning RF signals corresponding to respective channels; signal processing means coupled to said tuner means for generating a picture representative baseband signal including picture synchronization components; deflection means responsive to said synchronization component for generating horizontal and vertical rate deflection signals; and an image producing device responsive to said picture representative signal and said horizontal and vertical rate deflection signals for producing an image; and an on-screen channel indicator apparatus, said on-screen channel indicator apparatus comprising:

a ramp signal generator coupled to said deflection unit and to said tuning control means to generate a composite ramp signal including a ramp component varying at one of said deflection rates and a level component determined by said tuning signal;

first and second logic gates, each having at least one input and an output, included in a single integrated circuit;

said composite ramp signal being coupled to said input of said first logic gate, said first logic gate generating a first transition at its said output when the amplitude of said composite ramp signal traverses a predetermined switching threshold in a predetermined sense;

pulse generating means having an input coupled to said output of said first logic gate and an output coupled to said input of said second logic gate for generating at said output of said second logic gate a pulse having a predetermined time duration in response to said first transition;

coupling means for coupling said output of said second logic gate to said image reproducing device; and

feedback means coupled between said output of said pulse generating means and said first logic gate and cooperating with said pulse generating means for inhibiting said first logic gate from generating a second transition at its said output for a predetermined time after the generation of said first transition.

4,598,318

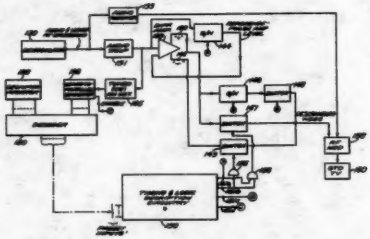
VIDEO ENCRYPTION SYSTEM

Clyde N. Robbins, Fort Washington, Pa., assignor to General Instrument Corporation, New York, N.Y.

Filed Jun. 10, 1983, Ser. No. 502,958
Int. Cl.[4] H04N *7/167, 5/53*
U.S. Cl. 358—124 **20 Claims**

19. Descrambler apparatus for descrambling an encrypted

video signal, said video signal being encrypted by inversion of selected video lines about an inversion reference level, said video signal further including a signal representative of said inversion reference level, said descrambler apparatus comprising inversion reference level storage means responsive to said video signal for providing a signal output representative of said



inversion reference level signal contained in said receied video signal; and inversion amplifier means for inverting said selected video lines of said video signal, said inversion amplifier means coupled to said output signal from said reference level storage means for inverting said selected video lines about said stored inversion level reference signal.

4,598,319

TELEVISION SYNCHRONOUS RECEIVER

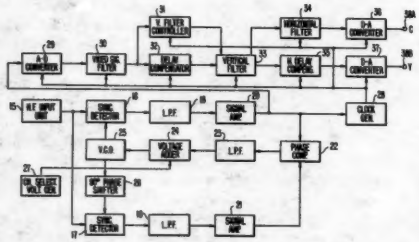
Yoichi Sakamoto, Takatsuki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 22, 1984, Ser. No. 623,114

Claims priority, application Japan, Jun. 24, 1983, 58-114799; Jun. 24, 1983, 58-114800

Int. Cl.[4] H04N *5/50*

U.S. Cl. 358—195.1 **18 Claims**



1. A television synchronous receiver comprising a voltage-controlled oscillator;

a 90° phase shifter for shifting an output signal from the voltage-controlled oscillator by 90°;

first and second synchronous detectors for effecting synchronous detection of in-phase and quadrature components of a video carrier signal by using output signals from the voltage-controlled oscillator and the 90° phase shifter as respective synchronous carriers;

first and second low-pass filters for filtering output signals from said first and second synchronous detectors respectively;

a phase detector for detecting a phase difference between the video carrier signal and the output signals from said voltage-controlled oscillator based on output signals from said first and second low-pass filters;

first means for feeding an output signal from said phase detector back to said voltage-controlled oscillator;

second means for converting a baseband video signal contained in the output signal from said first low-pass filter into a discrete value;

a vertical filter for filtering a video signal spectrum in a desired channel in an output signal from said second means; and

third means for converting an output signal from said vertical filter into a continuous value.

4,598,320

SOLID STATE PHOTOSENSITIVE DEVICE

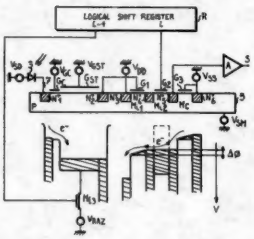
Marc Arques, Grenoble, France, assignor to Thomson-CSF, Paris, France

Filed Jun. 8, 1984, Ser. No. 618,506

Claims priority, application France, Jun. 14, 1983, 83 09827

Int. Cl.[4] H04N *3/15*

U.S. Cl. 358—213 **15 Claims**



1. A solid state photosensitive device comprising photon detection and charge integration cells connected to a reading stage which gives an output analysis image electric signal, wherein said reading stage comprises:

(a) voltage reading means each connected to a detection and integration cell through reading means for reading a potential corresponding to the quantity of charges in the integration zone or a cell;

(b) at least one addressing means for sequentially addressing one of the reading means; and

(c) means for resetting the previously read detection and integration cell.

4,598,321

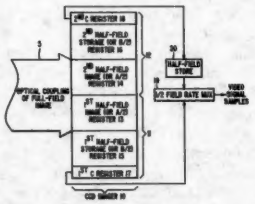
CCD IMAGERS WITH REGISTERS PARTITIONED FOR SIMULTANEOUS CHARGE TRANSFERS IN OPPOSING DIRECTIONS

Hammam Elabd, and Walter F. Kosonocky, both of Princeton, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 19, 1983, Ser. No. 562,518

Int. Cl.[4] H04N *3/14*

U.S. Cl. 358—213 **33 Claims**



1. In combination:

one or more CCD charge transfer channels having a plurality of parallel gate electrodes in an overlying array thereacross;

means for introducing charge packets into charge transfer stages induced in each said CCD charge transfer channel responsive to the application of static clocking signal voltages in recurring cyclic pattern to said parallel gate electrodes; and

means for periodically removing said charge packets from each said CCD charge transfer channel responsive to the application at selected times of dynamic clocking signal voltages in recurring cyclic pattern to said parallel gate electrodes, which means includes

means for applying at said selected times clocking voltages to said parallel gates so phased as to simultaneously propagate charge packets towards both ends of each charge transfer channel.

4,598,322

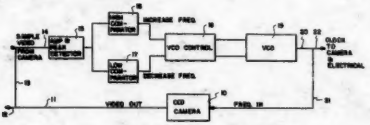
VIDEO LEVEL CONTROL FOR CCD CAMERA

Larry S. Atherton, Anoka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 13, 1985, Ser. No. 733,544

Int. Cl.[4] H01J *40/14*

U.S. Cl. 358—213 **12 Claims**



1. An automatic light level control system for a video camera comprising a frequency-variable camera clock means associated therewith for determining and controlling the scanning rate of said camera, and a control means connected to the video output of said camera and responsive to the level of the video output signal of said camera for controlling the rate of said camera clock means and thereby the scan rate of said camera such that the level of the video output signal is maintained within desired limits.

4,598,323

IMAGE PROCESSING APPARATUS

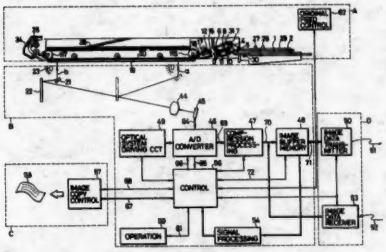
Takeshi Honjo, Kawasaki; Makoto Kitahara; Yasumichi Suzuki, both of Tokyo, and Naomi Takahata, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 22, 1984, Ser. No. 663,143

Claims priority, application Japan, Oct. 26, 1983, 58-200369; Oct. 26, 1983, 58-200370

Int. Cl.[4] H04N *1/04*

U.S. Cl. 358—285 **21 Claims**



1. An image processing apparatus comprising:

reading means operated in a first mode for reading image data while an original is being moved and a second mode for reading the image data by scanning while the original is stopped at a predetermined position;

memory means for storing the image data read by said reading means; and

selecting means for selecting one of the first and second modes in accordance with a state of said memory means.

4,598,324

AUDIO EVALUATION UNDER CONTROL OF VIDEO PICTURE FRAME NUMBER

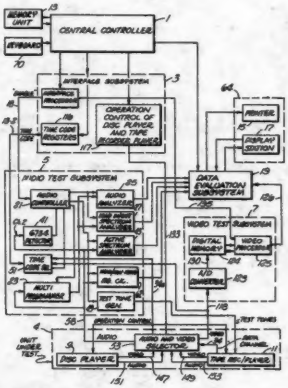
Edward Efron, Irvine; James O. McPherson, Newport Beach, and Young B. Kim, Long Beach, all of Calif., assignors to Discovision Associates, Costa Mesa, Calif.

Division of Ser. No. 339,011, Jan. 12, 1982. This application Sep. 30, 1982, Ser. No. 429,350

The portion of the term of this patent subsequent to Jun. 19, 2001, has been disclaimed.

Int. Cl.[4] H04N *17/06*; G11B *27/30, 27/36*

U.S. Cl. 358—341 **7 Claims**



1. A method of evaluating the audio characteristics of an audio-video program recorded on a storage member, the video portion of the program containing picture frame code numbers, comprising the steps of:

(a) establishing a predetermined picture frame number at which audio evaluation of the audio portion of the program is to commence;

(b) receiving and detecting picture frame code numbers from the video portion of the program;

(c) comparing the detected picture frame numbers with said predetermined picture frame number; and

(d) commencing audio evaluation of the audio portion of the program upon coincidence of said detected picture frame number and said predetermined picture frame number;

wherein

said audio portion of the program is contained on two audio channels of said storage member, and wherein said audio evaluation step (d) includes:

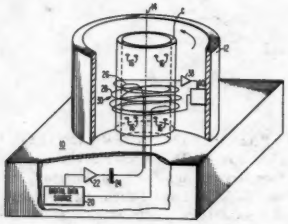
periodically comparing the amplitudes of the audio content on said two audio channels; and

determining if the audio portions of the program on the two channels are substantially similar in informational content.

4,598,325
APPARATUS FOR TRANSMITTING DIGITAL SIGNALS ACROSS A ROTARY GAP

Richard J. Tarzaiski, Camden, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed May 29, 1985, Ser. No. 738,862
Int. Cl.[4] G11B *5/09, 15/14, 5/02*
U.S. Cl. 360—39 **16 Claims**



1. An apparatus for coupling digital signals from a source to a utilization means, said digital signals being transmitted between a stationary platform and a rotatable carriage, said rotatable carriage adapted to be rotated about a shaft on said stationary platform, said apparatus comprising:

a first inductive element wound about the axis of said shaft;

a second inductive element on said rotatable carriage positioned so as to be inductively coupled with said first inductive element, wherein one of said first and second inductive elements is a primary coil and is coupled to said source and the other of said first and second inductive elements is a secondary coil and is coupled to said utilization means; and

a capacitor coupled in series between said source and said primary coil, said capacitor diminishing over a period of time the potential across said primary coil produced by the voltage levels of each of said digital signals from said source, to thereby provide signals of changing current through said primary coil.

4,598,326
DIGITAL RECORDING APPARATUS WITH DISPARITY REDUCING ENCODER

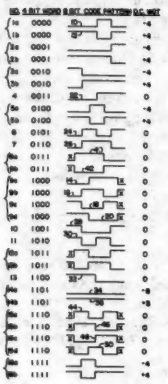
Hans R. Leiner, Aurora, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 18, 1983, Ser. No. 542,943
Int. Cl.[4] G11B *5/09;* **H03M** *7/00*
U.S. Cl. 360—40 **14 Claims**

1. Apparatus for transcribing digital data wherein first digital words containing a first number of first and second polarity bits are assigned code patterns chosen from a plurality of second digital words containing a larger second number of first and second polarity bits and wherein at least some of the first digital words are assigned at least two alternative code patterns and none of the code patterns contain a single bit of a first polarity with bits of the second polarity on both sides thereof, comprising:

first means having an input for receiving the plurality of first digital words and operable to produce an output of second digital words corresponding to the assigned code patterns, and

second means connected to the first means to test the second digital words and to cause an alternative code pattern for a word to appear in the output upon the occurrence of the existence of a single bit of the first polarity at the start of any particular second digital word followed by a bit of the second polarity, and preceded by a second digital word having a bit at the end thereof which is of the second polarity and the second means selects an alternative code

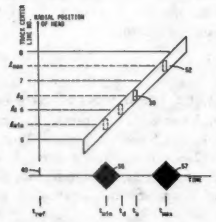


pattern for the particular word so that it has a starting bit of the second polarity.

4,598,327
SERVO CONTROL SYSTEM USING SERVO PATTERN TIME OF FLIGHT FOR READ/WRITE HEAD POSITIONING IN A MAGNETIC RECORDING SYSTEM

Shen Jen, Richardson, Tex., and William J. Kabelac, Morgan Hill, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 28, 1985, Ser. No. 749,694
Int. Cl.[4] G11B *5/56*
U.S. Cl. 360—77 **13 Claims**



1. In a magnetic recording data storage system having a head and means attached to the head for moving the head near a selected data track on the recording medium prior to the reading or writing of data, an improvement to the system comprising:

a group of segments of servo information recorded on the medium and spaced from one another in a direction generally perpendicular to the data tracks, each segment extending over at least one track and being slanted relative to the tracks;

means for generating a reference pulse indicative of the position of the head relative to the group of servo information segments in the direction along the data tracks;

means coupled to the reference pulse generating means and to the head for measuring the time from receipt of the reference pulse to the peak amplitude of the signal read by the head from one of the slanted segments of servo information; and

means coupled to the time measuring means and the head moving means for commanding the head moving means to

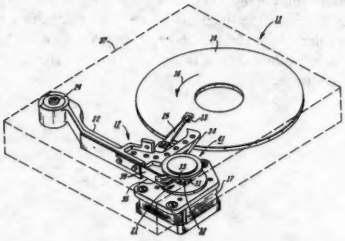
position the head to the centerline of the selected data track in response to the measured time.

4,598,328

MECHANICAL DAMPER FOR DISK DRIVES HAVING BAND DRIVE ACTUATORS

Thomas P. Frangesh, Campbell, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed May 9, 1983, Ser. No. 493,132
Int. Cl.[4] G11B *17/00, 5/012*
U.S. Cl. 360—97 **7 Claims**



1. In a disk drive having a head, an actuator for supporting said head for movement radially with respect to a disk-like recording media, a sealed enclosure containing said head, said actuator and said recording media, and a stepper motor for driving said actuator; said actuator including a band drive having a capstan, and said stepper motor having a drive shaft coupled to said capstan for selectively positioning said head radially with respect to said recording media in response to a seek command; the improvement comprising a solid state damper disposed within said enclosure for damping oscillation of said head upon conclusion of a seek, said damper including

an inertial mass, and

an elastomeric member coupled between said capstan and said inertial mass, said elastomeric member being formed from a low resiliency material and being configured to absorb torsional energy supplied by said mass to damp said oscillation.

4,598,329

SLACK LIMITER FOR VIDEOCASSETTES

Norman E. Nelson, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Mar. 17, 1983, Ser. No. 476,062
Int. Cl.[4] G11B *15/60, 15/32;* **B65H** *23/08*
U.S. Cl. 360—130.21 **1 Claim**

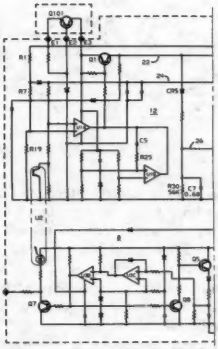
1. A magnetic recording tape cassette comprising a housing including means for defining a tape path and an internal section comprising a back surface, an elongate stem projecting from said back surface and having side surfaces extending transverse of said path, and an enlarged head on the end of the stem opposite said back surface; and a slack limiter device comprising a springy plastic film having first and second opposite edges, edge margins adjacent each of said opposite edges, and a third edge extending between said opposite edges, a low-friction wrapping extending around said first edge and along the edge margins adjacent said first edge, and a metal plate along one of the edge margins adjacent said second edge, said plate and film having a slot opening from said third edge and having an inner end opposite said third edge, and being positioned in close fitting relationship between said head and said back surface with said stem in close fitting engagement in said slot to anchor said device within said housing with said low friction wrapping biased against tape along said path by resilient bending of said film, said metal plate being resiliently bendable and having a projection midway along said slot engaging the side surface of said stem opposite said low friction wrapping, and said plate being notched adjacent the inner end of the slot and being resiliently bent adjacent said notch to provide spring tension in said plate biasing said projection against said stem.

4,598,330

HIGH POWER DIRECT CURRENT SWITCHING CIRCUIT

George K. Woodworth, Manassas, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1984, Ser. No. 666,587
Int. Cl.[4] H01H *73/18*
U.S. Cl. 361—13 **2 Claims**



1. A DC power switching circuit, connecting a load to a DC power source, comprising:

a normally open relay, having an energizing coil with a first end connected to a control input terminal and a second end, and having a pair of switching contacts, the first contact of said pair being connected to said load and the second contact of said pair being connected to said DC power source, said contacts closing from an open state after a first delay interval in response to an on-signal at said control input terminal;

an SCR having its principal current conducting path connected between said load and said DC power source and having its control gate connected to said second end of said relay energizing coil, conducting current between said load and said power source during said first delay interval, thereby reducing the potential difference between said first and second contacts of said relay, preventing arcing between said relay contacts during the closure thereof;

an FET having its principal current conducting path connected between said load and said DC power source and having a control gate;

a timer having a control input connected to said control input terminal and an output connected to said gate of said FET, maintaining on said FET gate for a duration of a second delay interval in response to an off-signal at said control input terminal, said relay contacts opening from a closed state in response to said off-signal after a delay

which is shorter in duration than said second delay interval;

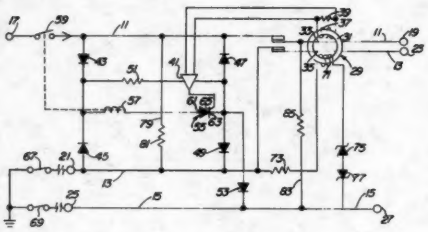
said SCR gate turning off substantially when said off-signal occurs and said timer turning on said FET substantially when said off-signal occurs, said FET device in response thereto conducting current between said load and said power source during said second delay interval, thereby reducing the potential difference between said first and second contacts of said relay, for preventing arcing between said relay contacts during the opening thereof.

4,598,331

GROUND FAULT CURRENT INTERRUPTER CIRCUIT WITH OPEN NEUTRAL AND GROUND LEAD PROTECTION

Raymond H. Legatti, Clearwater, Fla., assignor to Technology Research Corporation, Clearwater, Fla.

Filed Jul. 30, 1984, Ser. No. 635,459
Int. Cl.[4] H02H *3/26*
U.S. Cl. 361—46 **17 Claims**



1. A ground fault current interrupter circuit for use in a system having line, neutral and ground leads extending from a source of energy to a load comprising:

a differential transformer having a pair of opposed primary windings and a secondary winding;

circuit opening means responsive to a trip signal generated in said secondary winding when a ground fault occurs to open the line lead;

actuating means responsive to an open neutral lead or an open ground lead between the source and the ground fault current interrupter circuit to cause energization of said circuit opening means to open the line lead; and

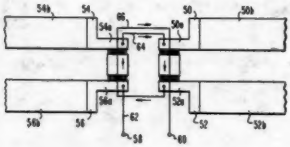
directing means to complete an energizing circuit for said circuit opening means to whichever of the neutral or ground leads is not open, without providing a current path between the neutral and ground leads.

4,598,332

CURRENT LIMITING APPARATUS UTILIZING MULTIPLE RESISTIVE PARALLEL RAILS

George A. Kemeny, Wilkins Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 20, 1984, Ser. No. 632,975
Int. Cl.[4] H02H *9/02, 9/08*
U.S. Cl. 361—58 **33 Claims**



1. A current limiting apparatus comprising:

a first pair of conductive rails;

a first propellable armature conductor slidably disposed between said first pair of conductive rails;

a second pair of conductive rails;

a second propellable armature conductor slidably disposed between said second pair of conductive rails;

means electrically connecting said first and second pairs of rails with each other, wherein current flow in each pair of conductive rails augments the accelerating force on the propellable armature conductor between the other pair of conductive rails; and

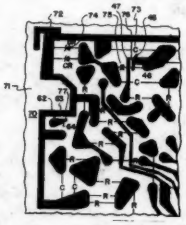
means connecting said rails to an external circuit such that under fault current conditions, each armature conductor is electromagnetically propelled by the fault current into a bore lined by a resistive portion of at least one of said rails, thereby adding circuit impedance to limit the fault current magnitude.

4,598,333

PRINTED WIRING BOARD MEANS WITH INTEGRAL DEW SENSOR

John T. Adams, and John E. Bohan, Jr., both of Minneapolis, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 12, 1985, Ser. No. 775,476
Int. Cl.[4] H01G *5/20;* **H01H** *29/00, 35/18*
U.S. Cl. 361—286 **12 Claims**



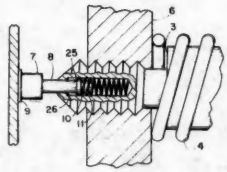
1. An electronic control device which changes from a normal mode of operation to an alternate safe mode of operation in the event that excess moisture or vapor is present within said device, including: printed wiring board means that has an insulated surface that in turn supports a plurality of conductive areas; electronic components mounted by said printed wiring board means, and electrically interconnected by said conductive areas to provide an electronic circuit for said control device; said electronic components including at least one electronic control means having a plurality of electrodes connected to said conductive areas as part of said control device with said electronic control means having a plurality of states of conductivity; said conductive areas including at least one pair of spaced edges to form dew sensing means; and said pair of spaced edges of said dew sensing means being capable of connecting between one of said plurality of electronic control means electrodes and said electronic circuit; said dew sensing means changing impedance between said spaced edges with the presence of vapor at said dew sensing means to in turn cause said electronic control means to change said state of conductivity to cause said control device to change from said normal mode of operation to said alternate mode of operation.

4,598,334

CAPACITIVE TUNING SCREW

H. Erwin Grellmann, Beaverton; Keith E. Jones, Aloha, and John A. Wright, Portland, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Feb. 7, 1985, Ser. No. 699,377
Int. Cl.[4] H01G 5/16; F16B 33/00
U.S. Cl. 361—290 11 Claims



6. A device for varying the clearance between two electrical elements coacting as a capacitor, comprising:

a circumferentially threaded screw having a longitudinal cavity,

a first electrical element extending from the end of said screw,

and a second electrical element on the surface of an electrical circuit board or substrate,

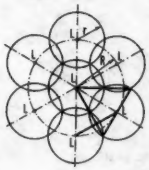
said first electrical element being slidably received within said cavity when said first element contacts said second element.

4,598,335

IMPREGNATED WOUND CAPACITOR

Reinhard Behn, Munich, and Josef Solar, Heidenheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 10, 1985, Ser. No. 690,272
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1984, 3402340
Int. Cl.[4] H01G 3/17, 1/14
U.S. Cl. 361—314 5 Claims



1. In an impregnated, wound capacitor comprising (a) dielectric strips which consist at least in part of plastic foils swelled by an impregnant; (b) electrodes formed of regenerable, thin metal layers arranged adjacent at least a part of said dielectric strips, respective ones of said electrodes being connected together at opposite end faces of the capacitor coil by means of end contact layers, thereby defining electrodes of opposite polarity;

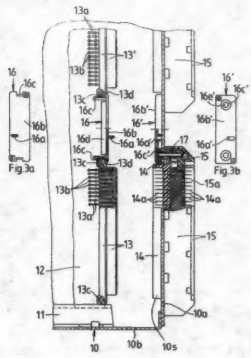
the improvement comprising impregnation holes arranged in the dielectrically active part of the capacitor coil having a maximum spacing R, between successive holes, equal to $R=r\sqrt{3}$, where r is the impregnation reach.

4,598,336

INSERTION CODE ARRANGEMENT FOR INTERCHANGEABLE CIRCUIT BOARD MODULES

Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Lossburg 1, Fed. Rep. of Germany

Filed Oct. 3, 1983, Ser. No. 538,750
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1982, 3236603
Int. Cl.[4] H05K 7/14, 5/04
U.S. Cl. 361—391 14 Claims



1. In an electronic circuitry cabinet which defines a plurality of fixed module segments designed to hold a like number of circuit board modules of substantially equal size in a parallel side-by-side arrangement, and in which the circuit board modules are guided for insertion and removal along insertion guide means in the module segments of the circuitry cabinet, the leading edge of each circuit board module being a contact edge carrying at least one multi-conductor contact bar which, in the normal inserted position of the circuit board module, is engaged by a matching stationary multi-conductor contact bar in the associated module segment of the circuitry cabinet; in such a circuitry cabinet, an insertion code arrangement for the positive prevention of the accidental insertion and connection of a circuit board module in any other than its associated module segment, the insertion code arrangement comprising in combination:

a set of distinct pairs of cooperating male and female code members, each distinct pair being assigned to a circuit board module and its associated module segment in the circuitry cabinet;

a code protrusion arranged on each male code member in a location distinguishing it from all other male code members of the set; and

a matching code recess arranged on each female code member in a location corresponding to that of the code protrusion of the associated male code member; and wherein

one member of each distinct code member pair is removably attached to, and supported by, a circuit board module;

the other member of said pair is removable attached to and supported in a stationary position by the associated module segment of the circuitry cabinet; and

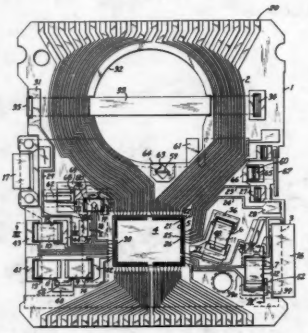
the male and female members of each distinct code member pair are permanently coded through the arrangement of their matching code protrusions and code recesses as integral parts of their structure.

4,598,337

ELECTRONIC CIRCUIT BOARD FOR A TIMEPIECE

Paul Wuthrich; Lyman R. Daigle, both of Watertown, and Gerald Cozzolino, Oakville, all of Conn., assignors to Timex Corporation, Waterbury, Conn.

Filed Sep. 17, 1984, Ser. No. 651,131
Int. Cl.[4] H05K 1/18
U.S. Cl. 361—401 13 Claims



1. An electronic circuit board for a timepiece comprising:
a board of insulating material defining a plurality of board apertures therein, and having a plurality of conductive pads located adjacent said board apertures,
a plurality of discrete components each having an insulated portion and a plurality of spaced conductive terminals disposed in a plane parallel to said board, said components having a thickness substantially that of the board thickness,
a thin conductive backplate secured to said board on the side thereof opposite said conductive pads, having backplate apertures therein and having bridging portions adjacent said backplate apertures,
said board apertures being shaped to accommodate and locate said components,
said backplate apertures being shaped and located to avoid at least some of the component conductive terminal portions,
said bridging portions being beneath said board apertures and being shaped and located to support said components, and
said conductive terminal portions of the components being connected to selected ones of said conductive pads.

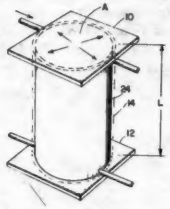
4,598,338

REUSABLE FAST OPENING SWITCH

John P. Van Devender, and David Emin, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 21, 1983, Ser. No. 564,107
Int. Cl.[4] H01G 9/18; H01L 45/00
U.S. Cl. 361—435 11 Claims

1. A reusable fast opening switch for pulse power applications comprising:
a pair of spaced, plate, conductors;
a bulk magnetic semiconductor disposed between said conductors, said magnetic semiconductor being highly conductive below a critical temperature (T_C) and rapidly transforming into an insulator above T_C by undergoing at least an order of magnitude change in resistivity for a temperture change of 10° C.: and



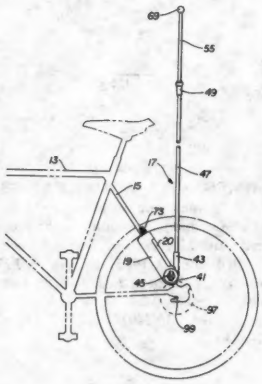
shock absorber means for protecting said semiconductor from shock waves generated during a resistivity transition.

4,598,339

LIGHT WAND ASSEMBLY FOR BICYCLES, MOTORBIKES, ETC.

Michael Ainsworth, Detroit, Mich., assignor to George Ainsworth; Mina Ainsworth and Robert Ainsworth, all of Detroit, Mich., part interest to each

Filed Mar. 4, 1985, Ser. No. 708,035
Int. Cl.[4] B62J 6/00; F21V 33/00
U.S. Cl. 362—72 16 Claims



15. A light wand assembly for connection to a vehicle including a mounting member thereon;
an electrical component case;
a clamp means on the case removably secured to said mounting member;
an electrical power source;
an electrical circuit within said case and connected to said power source;
said circuit including a sequencer generating circuit;
and an on/off control switch on said case connected to said sequencer generating circuit;
a socket arm upon said case;
an elongated hollow support member secured to said socket arm;
an elongated transparent hollow light wand at one end secured to said support member;
a series of longitudinally spaced bulbs nested within said wand along its length;
and a cable connected to said sequencer circuit and including a plurality of leadwires individually connected to each of said bulbs, for intermittent illumination thereof in accordance with said sequence generating circuit for a pre-

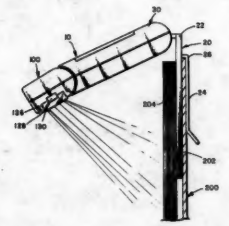
determined sequence of progressive illumination along the length of said wand.

4,598,340

PORTABLE BOOK LIGHT

Jack Dwosh, 10000 Santa Monica Blvd., Los Angeles, Calif. 90067, and Clive Edwards, 2698 Locksley Pl., Los Angeles, Calif. 90039

Filed Aug. 23, 1985, Ser. No. 768,622
Int. Cl.[4] A47B *19/00*; F21L *7/00*
U.S. Cl. 362—98 **9 Claims**



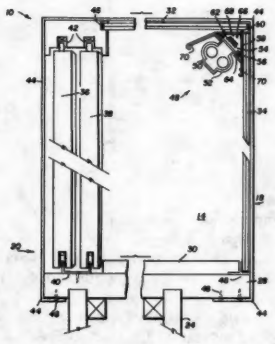
1. A Portable Light Source comprising:
a. a central casing member;
b. a light source containing and shielding member rotatably mounted to one end of said central casing member;
c. an attachment means rotatably attached to the opposite end of said central casing member;
d. said central casing member comprising an internal chamber bounded by a pair of side walls and a lower attachment means receiving section bounded by a pair of side walls;
e. said side walls of the internal chamber of said central casing member supporting a multiplicity of oppositely disposed positive and negative terminal plates;
f. a multiplicity of batteries wherein each battery is disposed between a respective pair of positive and negative terminal plates
g. said light source containing and shielding member comprising an internal chamber and a removable transparent shield protecting the internal chamber;
h. the internal chamber of said light source containing and shielding member further comprising a light source retaining fixture and a light source retaining member retained thereby;
i. a light source retained within said light source retaining member;
j. said attachment means comprising a pair of attaching members;
k. at least of one the attaching members of said attachment means attached to a first internal casing half;
l. said first internal casing half designed to fit into and abut the internal side walls of the attachment means receiving section of said central casing member;
m. a first internal side wall of the attachment means receiving section of said central casing member containing a mating gear;
n. the second oppositely disposed internal side wall of the attachment means receiving section of said central casing member containing a pair of conducting plates which are separated by a pair of oppositely disposed gaps;
o. one end of said first internal casing half comprising a toothed gear which abuts said mating gear on the first internal side wall of the attachment means receiving section of the central casing member when said first internal casing half is placed inside said attachment means receiving section;
p. the opposite end of said first internal casing half containing a two pronged metal clip which abuts said pair of conducting plates when when said first internal casing half is placed inside said attachment means receiving section of the central casing member such that a respective one of the metal prongs comes in contact with a respective one of said conducting plates or a respective one of said gaps separating the conducting plates, depending upon the degree of rotation of the toothed gear relative to its mating gear;
q. a first conducting means running from a portion of said light bulb retaining member to a first one of said conducting plates located on the internal side wall of said attachment means receiving section of the central casing member;
r. a second conducting means running from a portion of said light bulb retaining member to an uppermost metal plate containing a positive or negative terminal;
s. a connecting means connecting the lowermost metal plate containing a positive or negative terminal to the second conducting plate located on the internal side wall of said attachment means receiving section of the central casing member; and
t. a mating second internal casing half to close the first internal casing half;
u. whereby the light source circuit is closed when a respective one of said pair of metal prongs touches a respective one of said pair of conducting plates located at the lower side wall of said attachment means receiving section of the central casing member to thereby permit current to flow though said multiplciity of batteries and light said lighting source and the light source circuit is opened when a respective one of said pair of said metal prongs touches a respective gap separating the two conducting plates.

4,598,341

DISPLAY CASE LIGHTING SYSTEM

Virgil D. Brackhahn, and Gary W. Cook, both of Beatrice, Nebr., assignors to Storekraft Manufacturing Co., Beatrice, Nebr.

Filed Apr. 16, 1985, Ser. No. 723,892
Int. Cl.[4] A47F *11/10*; F21S *3/02*
U.S. Cl. 362—125 **7 Claims**



1. A display case lighting system for providing a display space of a display case for jewelry or the like with a high intensity, economically operable, compact light source which can provide generally even illumination over the length of the display space, while generating little heat,
said lighting system, comprising:
a light bar for at least one single base compact fluorescent lamp said light bar including a shell means including a front flange and a rearwardly extending flange which join at a common front edge at generally a right angle, channel means provided rearwardly on each of said

front flange and rearwardly extending flange, these channel means opening toward one another and being constructed and arranged to slidingly receive insert plate means;

at least one lamp holder for a single base compact fluorescent lamp;

each said lamp base being mounted to an insert plate means and having electrical wiring extending to a rear side of said insert plate means;

said insert plate means being slidingly received in said channel means thereby forming with said shell means a raceway for said electrical wiring;

means for securing said light bar in a display case so as to extend substantially lengthwise of the case;

a ballast means, including a housing, mounted in said housing a ballast for each lamp of the light bar; an electrical power cord for connecting the ballasts to a source of electrical power and electrical wiring extending from the ballasts to electrically connect with said electrical wiring of each said lamp holder, said ballast means being constructed and arranged to be unobtrusively mounted to the display case.

4,598,342

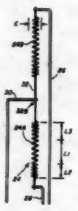
LOW WATTAGE DOUBLE FILAMENT TUNGSTEN-HALOGEN LAMP

George J. English, Reading; Peter R. Gagnon, Georgetown, and Stephen J. Leadvaro, Salem, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jul. 9, 1984, Ser. No. 629,132

Int. Cl.[4] F21M *3/20*; H01J *1/88*

U.S. Cl. 362—213 **32 Claims**



1. A lamp member comprising:

a tungsten-halogen capsule having a pressed sealed end forming a wedge base portion, said capsule including an envelope with an inert gas fill and a halogen disposed therein;

a filament structure axially located within said envelope and supported by said wedge base portion, said axial filament structure including at least two coiled filament members located in an end to end manner and formed from a single wire intercoupled by an intermediate member, each of said filament members capable of operating independently from the other and each including a central portion and two opposed end portions, the coil spacing of said central portion being greater than the coil spacing at said opposed end portions; and

means for supporting and selectively activating each of said filament members, said support and selective activation means being disposed within said envelope and supported by said wedge base portion.

4,598,343

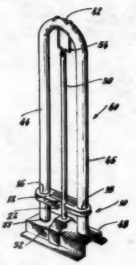
U-LAMP LEG BRACE

Malcolm E. Sorrell, Norwalk, Conn., assignor to Voltarc Tubes, Inc., Fairfield, Conn.

Filed Dec. 6, 1984, Ser. No. 678,737

Int. Cl.[4] F21S *5/00*

U.S. Cl. 362—216 **2 Claims**



1. A U-shaped lamp leg brace for supporting a U-shaped fluorescent lamp of the type having a bend with separated legs of predetermined diameter extending in a same direction from said bend comprising:

a one-piece, non-metallic support spacer having enclosed openings on opposite ends thereof,

said openings in said support spacer member being spaced in accordance with the separation between the legs of the U-shaped lamp,

said openings in said support spacer member having diameters corresponding to the diameters of the legs of the U-shaped lamp whereby the legs of the U-shaped lamp are adapted to be inserted for a non-slip friction fit in said openings thereby supporting, separating and aligning the legs of the U-shaped lamp during handling, shipment, carrying and installation, and

wherein the U-shaped lamp leg brace further having a U-shaped slot located centrally between said openings, said slot providing clearance for a separate support rod attached to an intermediate part of said U-shaped lamp which is employed to hold the U-shaped lamp in a socket.

4,598,344

ELONGATED LAMP, PARTICULARLY FLUORESCENT LAMP

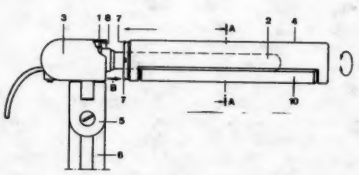
Gerhard Nadler, Munich, Fed. Rep. of Germany, assignor to Patent-Treuhand Gesellschaft fur elektrische Glühlampen mbH, Munich, Fed. Rep. of Germany

Filed Jan. 9, 1985, Ser. No. 689,952

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1984, 8402555[U]

Int. Cl.[4] F21V *17/02*

U.S. Cl. 362—220 **7 Claims**



1. Single-ended, compact fluorescent lamp (2)-socket (1) -and reflector (9) combination having

a two-part housing (3, 4),

support means (5, 6) connected to a first part (3) of the housing for supporting the housing in a predetermined position;

wherein

the first part (3) of the housing is formed to retain a socket (1) for the fluorescent lamp (2) therein, the lamp (2) projecting from said socket;

a second part (4) of the housing is elongated and, in cross section, curved to cover, at least in part, the fluorescent lamp; and

a reflective surface (9) is provided on the inside of said second part of the housing at the surface thereof facing the lamp;

said combination comprising

means for selectively placing the second housing part (4) and the reflector (9) therein in a desired angular position with respect to the support means (5, 6) without disturbing the position of the lamp (2) in the socket, comprising

an interlocking elastic snap-in connection (7, 8) formed on, respectively, said first and second housing parts, for separably connecting said first and second housing parts, including projections and recesses formed, respectively, on the housing parts (3, 4) and positioned for selective placement of the second housing part (4) in the first housing part (3) in a selected angular position;

said two housing parts being separable along a plane essentially transverse to the longitudinal extent of said fluorscent lamp (2),

said projections and recesses being located for selective engagement in at least two different angular positions about said lamp (2) upon snap-in thereof to permit selective direction of light from the lamp (2) by the reflector (9) with respect to the position of the support means (5, 6).

4,598,345

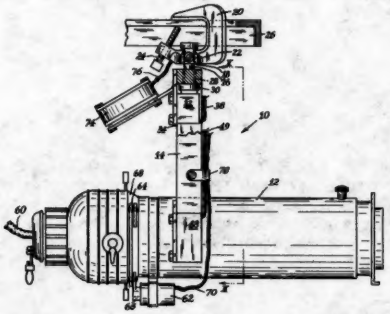
REMOTE CONTROLLED ILLUMINATION EQUIPMENT

Jeff Kleeman, 24555 Wayman St., Newhall, Calif. 91321

Filed Jun. 6, 1985, Ser. No. 741,947

Int. Cl.[4] F21P *5/02*

U.S. Cl. 362—233 **7 Claims**



1. A remotely controlled illumination equipment having a rotatable and tiltable spotlight with variable opening and variable light output, structural members and electrical wiring, comprising:

a radio-frequency receiver mounted on a said structural member of said illumination equipment, having a plurality of operating channels adapted to receive signals providing power source outputs,

a plurality of servomotors each capable of operating a specific illumination equipment element, each said servomotor mounted in the proximity of the to be operated illumination equipment unit,

a radio-frequency transmitter, positioned remotely from said radio-frequency receiver, having a plurality of operating channels compatible with those of said radio-frequency receiver,

a plurality of multi-throw joy sticks connected with said radio-frequency transmitter,

each said joy stick throw, when manually actuated, causing a specific command signal for transmission through a specific channel to the corresponding channel of said radio-frequency receiver, the availability of a specific power source output energizing a said servomotor for the duration of a said command signal transmission and thereby the execution of said command.

4,598,346

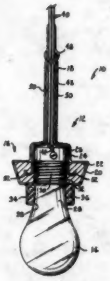
SUBMERSIBLE FISHING LIGHT

Gerald J. Bodde, R.R. 4, Box 294, St. Joseph, Mo. 64504

Filed Jul. 18, 1985, Ser. No. 756,184

Int. Cl.[4] F21V *29/00*

U.S. Cl. 362—267 **18 Claims**



1. A submersible fishing light comprising:

a water tight shell;

a socket in said shell;

elongate electrical wiring including a pair of electrical conductors connected with said socket at a location within said shell, said wiring extending out of said shell to permit the shell to be lowered thereon into the water and said conductors being adapted for connection with an electrical power source to supply electrical power to said socket;

an incandescent bulb having a neck extending through said shell and a base received by said socket at a location within the shell to illuminate the bulb when electrical power is supplied to said socket;

a spongy seal ring in said shell closely surrounding said neck of the bulb to effect a water tight seal between said shell and said neck of the bulb; and

a weight carried in said shell to serve as ballast for sinking same.

4,598,347

HEAT SINK FLOODLIGHT CASING AND REFLECTOR

James E. Peppers, Memphis, Tenn., assignor to FL Industries, Inc., Livingston, N.J.

Filed Oct. 18, 1984, Ser. No. 662,341

Int. Cl.[4] F21V *29/00*

U.S. Cl. 362—373 **6 Claims**

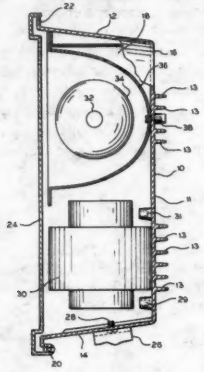
1. A floodlight for a lamp with an arc tube comprising:

a metal casing forming a housing;

a bezel mounted across the front of said housing;

a reflector assembly within said housing, said reflector being

in direct contact with an internal surface of said housing, and a plurality of elongated fins integrally protruding



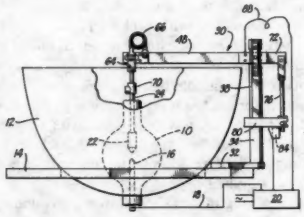
from an external surface of said housing to form a heat sink assembly with the reflector and the housing.

4,598,348

ARC LAMP SUPPORT SYSTEM

Thomas A. Richter, 640 19th St., Manhattan Beach, Calif. 90266

Filed Jan. 19, 1984, Ser. No. 571,923
Int. Cl.[4] F21V *15/04*
U.S. Cl. 362—390 **17 Claims**



1. An arc lamp support system comprising:

a connector for coupling to a first electrode of a high intensity arc lamp having an envelope and having first and second electrodes fixed to and within said envelope, one of said electrodes being an anode electrode and the other being a cathode electrode;

means for supporting said second electrode and said envelope;

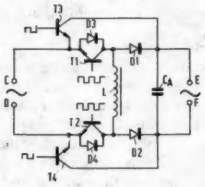
means for supporting said connector coupled to said first electrode so that said first electrode of the high intensity arc lamp is free of forces applied by said connector to move a limited distance in any direction to substantially eliminate stress on said envelope and said connector is constrained by said connector supporting means in all directions to a limited space to limit the distance of possible travel of said first electrode upon envelope destruction.

4,598,349

ELECTRONIC TRANSFORMER COMPOSED OF FLYBACK CONVERTERS

Klaus B. Löhn, Simmerath, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 4, 1984, Ser. No. 646,711
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1983, 3333656
Int. Cl.[4] H02M *5/458*
U.S. Cl. 363—8 **12 Claims**



1. An electronic transformer comprising first and second flyback switching converters for converting the positive and the negative periods of an input alternating voltage source into a high frequency voltage and subsequently rectifying same to produce an output alternating voltage having a frequency corresponding to that of the input alternating voltage, characterized in that the flyback switching converters each comprise a high-frequency controlled switching transistor coupled to a respective fly-wheel diode, a choke coil coupled to each of the flyback converters, an output capacitor coupled to the first and second flyback converters, an input capacitor coupled to the first and second flyback converters, the choke coil and the output and input capacitors being common to the two flyback converters, first and second backward diodes connected parallel to respective switching transistors of each flyback converter, and wherein each flyback converter includes an auxiliary transistor switching at the input frequency and coupled in shunt with the respective switching transistor and the flywheel diode so as to shunt the switching transistor and flywheel diode of the other fly-back converter in its inactive state.

4,598,350

POWER CONVERTER CONTROL APPARATUS AND POWER CONVERTER CONTROL METHOD

Takami Sakai, and Haruhisa Inokuchi, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 21, 1985, Ser. No. 714,389
Claims priority, application Japan, Mar. 29, 1984, 59-61363
Int. Cl.[4] H02J *3/36*
U.S. Cl. 363—35 **11 Claims**

1. A power converter control apparatus being adapted to a first converter and a second converter which is coupled to the first converter via power transmission lines, said power converter control apparatus comprising:

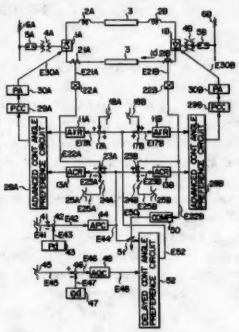
first control means for controlling said first converter so that a current of said power transmission lines follows a given current reference;

second control means for controlling said second converter so that reactive power handled by the power converter control apparatus follows a given margin angle value;

detector means for detecting whether or not the current of said power transmission lines reaches a given rated current value and generating a detection signal when said current reaches said given rated current value; and

signal supply means for supplying, when said detection

signal is generated, said second control means with a margin angle signal which corresponds to said given



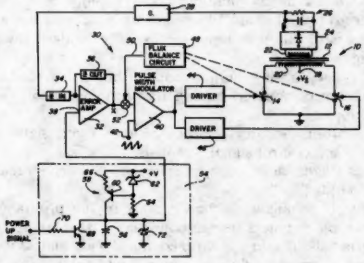
current reference and serves as said given margin angle value.

4,598,351

SOFT-START CONTROL FOR A PUSH-PULL CONVERTER-REGULATOR WITH A FLUX BALANCING CIRCUIT

Donald G. Fair, Belvidere, Ill., and Pandipati R. K. Chetty, Gaithersburg, Md., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Feb. 27, 1984, Ser. No. 584,114
Int. Cl.[4] H02M *3/337*
U.S. Cl. 363—49 **6 Claims**



1. In a converter controlled in response to a pulse width modulated waveform to provide a DC output, the converter having an error detecting means for comparing the output of the converter to a reference signal to vary the duty cycle of the pulse width modulated (PWM) waveform, improved means for controlling the start-up of said converter to limit inrush currents, comprising:

means for signaling the start-up of the converter; and

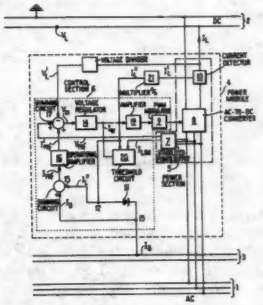
means for providing a varying reference signal to said error detecting means, said reference signal gradually incresing from zero to a predetermined level so that the duty cycle of the PWM waveform gradually increases following the signaled start-up of said converter.

4,598,352

CONTROLLED PARALLEL CONVERTER PLANT

Ingar Narvhus, Kolbotn, and Jan P. Mikalsen, Trondheim, both of Norway, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 30, 1984, Ser. No. 605,710
Claims priority, application Norway, May 2, 1983, 831540
Int. Cl.[4] H02M *7/04*
U.S. Cl. 363—69 **3 Claims**



1. An electrical converter plant comprising:

a plurality of converter modules connected in parallel between an AC power supplying line and a power consuming load line wherein each of said converter modules comprises:

an AC to DC converter connected between said power supplying line and said power consuming load line;

a current sensor connected to an output of said AC to DC converter;

a multiplicator circuit whose input is connected to an output of said current sensor and which produces an output proportional to the maximum load current for the AC to DC converter;

a threshold circuit having an input connected to an output of said multiplicator circuit and another input connected to a constant current signal proportional to said maximum load current for the AC to DC converter, said threshold circuit having an output connected to said AC to DC coverter and functioning through said output to limit the load current for said AC to DC converter to a maximum;

a voltage divider having an input connected to an output of said AC to DC converter and an output connected to a first summing circuit;

said first summing circuit which has an input from said voltage divider, an input from a stabilized reference voltage circuit, and an input from an operational amplifier and which has an output to said AC to DC converter;

said stabilized reference voltage circuit which has a plurality of inputs connected to said AC power supply line;

said operational amplifier which has an input connected to a second summing circuit;

said second summing circuit which has an input connected to the cathode of said idealized diode and another input connected to the anode of said idealized diode and to said common current balance bus; and

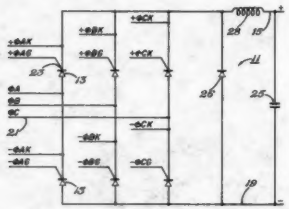
an idealized diode whose cathode is connected both to said output of said multiplicator circuit and to a second summing circuit and whose anode is connected to a common current balance bus and for which the voltage is approximately zero between the cathode and the anode while said electrical converter plant is in operation.

4,598,353

THYRISTOR FIRING CIRCUIT FOR DETERMINING PHASE ANGLE

John M. Leuthen, Claremore, Okla., assignor to Hughes Tool Company, Houston, Tex.

Filed Nov. 7, 1984, Ser. No. 669,143
Int. Cl.[4] H02M 7/08
U.S. Cl. 363—87 **6 Claims**



1. In a thyristor circuit having at least two thyristors, one for passing positive current and one for passing negative current of a waveform, each having a gate which causes the thyristor to conduct when the thyristor is fired, an improved means for firing the thyristors, comprising in combination:

a ROM having a plurality of memory locations, each memory location containing the on/off condition of one of the thyristors at a particular increment of the waveform, the ROM having a plurality of data lines, each of which is coupled to the gate of one of the thyristors for firing the thyristor;

comparator means having one input connected to a source of the waveform and another to one of the data lines for comparing a zero cross of the waveform with the ROM output on the data line to determine an actual phase difference between the firing of the thyristor and the beginning of the waveform, and to produce a pulse whose width is proportional to the phase difference;

means for smoothing the pulses into a DC voltage proportional to the actual phase difference;

demand means for providing a DC demand voltage proportional to a desired phase difference between the firing of the thyristors and the waveform;

error means for determining the error difference between the demand voltage and the phase voltage;

oscillator means for providing a constant frequency of pulses at some multiple of the line frequency and also connected to the error means for momentarily changing the frequency of the pulses if a phase error difference exists; and

counter means for counting the pulses of the oscillator means and providing a binary output to the ROM that determines which particular increment of the waveform the ROM should output on its data lines.

4,598,354

DATA INPUT AND OUTPUT DEVICE FOR A DRIVE REGULATION APPARATUS OPERATED BY A DIGITAL COMPUTER

Gerhard Kindler, Meggen, and Ray Stanyard, Buchrain, both of Switzerland, assignors to Inventio AG, Hergiswil, Switzerland

Filed Dec. 14, 1983, Ser. No. 561,217
Claims priority, application Switzerland, Dec. 20, 1982, 7418/82
Int. Cl.[4] H02P 7/00; B66B 1/28
U.S. Cl. 364—174 **4 Claims**

1. A data input and output device for a drive regulation apparatus operated by a digital computer, wherein a path regulation circuit of the drive regulation apparatus is subordinated to at least one velocity regulation circuit, comprising:

a digital computer provided with a data bus;

a digital tachometer;

at least one path counter connected to said digital tachometer;

a further digital tachometer;

a velocity counter connected to said further digital tachometer;

an interface for directly connecting said path counter and said velocity counter to said data bus of the digital computer;

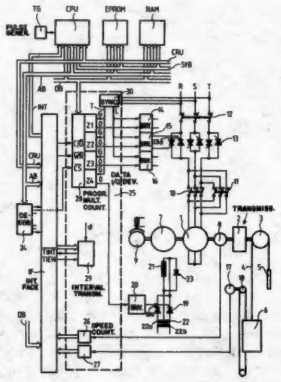
said interface being provided with an interrupt input;

said digital computer being provided with at least one random access memory having storage locations;

an interval transmitter controlling the input and output of data;

said interval transmitter being connected with said interrupt input of the interface;

said storage locations of said at least one random access memory of the digital computer storing during each interrupt the results of a predetermined number of readings of the path and velocity counters;



a programmable multiple counter provided with control terminals and data input means;

said programmable multiple counter being connected by means of said control terminals with the interface and by means of said data input means with the data bus of the digital computer;

said programmable multiple counter being provided with a number of counters having start terminals and overflow terminals;

a synchronization device provided with trigger signal terminals and control signal terminals;

driver stages for adjusting members of the drive regulation apparatus; and

said start terminals of the counters of the programmable multiple counters being connected to said trigger signal terminals of said synchronization device and said overflow terminals of the counters and said control signal terminals of the synchronization device being connected to said driver stages of said adjusting members of the drive regulation apparatus.

4,598,355

FAULT TOLERANT CONTROLLER

John E. Shepler; Douglas A. Rinker, both of Rockford; Bruce D. Beneditz, Roscoe; John J. Vicari, and Dennis T. Faulkner, both of Rockford, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

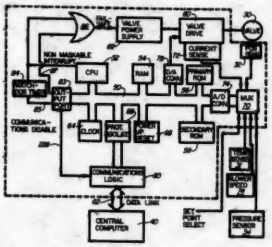
Filed Oct. 27, 1983, Ser. No. 545,901
Int. Cl.[4] G05B 9/02, 23/02; G06F 11/00
U.S. Cl. 364—184 **9 Claims**

1. In a controller operable in a normal mode of operation

wherein an output device is controlled in response to a sensed condition, an improved means for safely operating the output device under fault-producing conditions, comprising:

means for detecting a fault in the controller or output device;

means responsive to the fault detecting means for controlling the output device in a failsafe mode of operation



wherein the output device is safely operated without regard to the sensed condition when a fault is detected; and

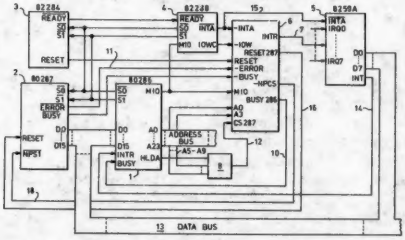
means responsive to the fault detecting means for returning to the normal mode of operation only if the existence of the fault can be detected while in the failsafe mode and the fault ceases to exist during such time.

4,598,356

DATA PROCESSING SYSTEM INCLUDING A MAIN PROCESSOR AND A CO-PROCESSOR AND CO-PROCESSOR ERROR HANDLING LOGIC

Mark E. Dean, Boynton Beach, and Dennis L. Moeller, Delray Beach, both of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1983, Ser. No. 567,296
Int. Cl.[4] G06F *13/14, 13/42*
U.S. Cl. 364—200 **5 Claims**



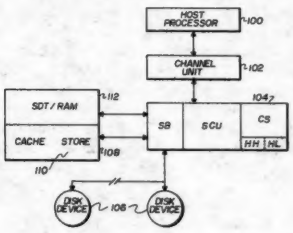
1. A data processing sysem comprising a main processor, a co-processor having a busy output which, when active, indicates that the co-processor is executing a command and is not available for external data transfer, and an error output which, when active, indicates a co-processor malfunction, and a logic circuit having inputs coupled respectively ot the error and busy outputs of the co-processor and including first logic means responsive only to coincident active error and busy outputs to generate an interrupt request signal to initiate a main processor error interrupt routine, second logic means responsive to an active busy signal from the co-processor to provide an active busy signal to the main processor, and latching means responsive to the interrupt request signal to latch the active busy signal to the main processor to prevent the main processor from executing a co-processor instruction until the interrupt is handled by said routine.

4,598,357

CACHE/DISK SUBSYSTEM WITH FILE NUMBER FOR RECOVERY OF CACHED DATA

Robert E. Swenson, Mendota Heights; Merlin L. Hanson, Arden Hills, and Larry J. Kelson, Shoreview, all of Minn., assignors to Sperry Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 207,155, Nov. 14, 1980, abandoned. This application Jan. 25, 1983, Ser. No. 460,737
Int. Cl.[4] G06F *11/00, 12/12, 13/00*
U.S. Cl. 364—200 **8 Claims**



1. In a cache/disk system including a host processor for issuing commands specifying an operation to be performed and an address, a disk drive device for driving a disk, a cache store for storing segments of data, a segment descriptor store for storing a segment descriptor corresponding to each of said segments of data, and a storage control unit interfacing with said host processor, said disk drive device, said cache store and said segment descriptor store, said storage control unit including means for destaging to said disk segments of data which have been written to while in said cache store, the improvement comprising:

means in said host processor for issuing a file number as part of a command, said file number specifying an address in a directory recorded on said disk;

means in said storage control unit for storing said file number as part of the segment descriptor associated with a data segment involved in the operation specified by the command;

detecting means for detecting when said means for destaging segments of data to said disk is unable to destage a segment;

means responsive to said detecting means for generating a status word and a sense message, said sense message including said file number;

means for transmitting said status word and said sense message to said host processor;

means in said host processor responsive to said sense message for reading into the host processor the segment of data which could not be destaged and for assigning new disk space to store the segment of data which could not be destaged; and

means in said storage control unit responsive to a command from the host processor for writing into the new disk space that segment of data which could not be destaged.

4,598,358

PIPELINED DIGITAL SIGNAL PROCESSOR USING A COMMON DATA AND CONTROL BUS

James R. Boddie, Hazlet; Renato N. Gadenz, and John S. Thompson, both of Tinton Falls, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 120,058, Feb. 11, 1980, abandoned. This application Oct. 29, 1982, Ser. No. 437,544
Int. Cl.[4] G06F *9/36*
U.S. Cl. 364—200 **4 Claims**

1. A pipelined digital signal processor comprising:

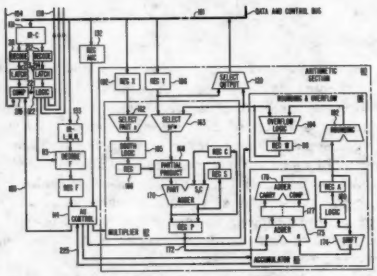
a source (100 or 105) for providing a stream of instruction words for controlling routine processing operations and for providing a stream of data words, the source compris-

ing means for storing the fixed data words interleaved with the instruction words in sequentially addressed locations;

an arithmetic section (**110**) for processing one data word with another data word through selected processing subsection (**112, 115**) preforming operations represented by an expression, thereby producing a resultant data word (in REG A);

a destination (**105**) for receiving the resultant data word from the arithmetic section;

control means responsive to an instruction word (i.e., I_i) from the source during each processor cycle for controlling processing subsections operations during a subsequent processor cycle, each processing subsection (i.e., **112**) responsive to the instruction word for performing an operation relating to a different expression than the other processing subsections (i.e., **115** or **116**) during the subsequent processor cycle ($i+2$), the control means including source and destination addressing means responsive to the instruction word for producing and applying to the source



and destination a stream of addresses during a processor cycle, each processor cycle of addresses including an instruction word address, a fixed data word address, a variable data word address and a resultant data word address, the addressing means further comprising a register means responsive to the instruction word address stored in the register for uniformly incrementing the instruction word address and storing the result in the register as a fixed data word address;

means responsive to the fixed data word address stored in the register for uniformly incrementing the fixed data word address and storing the result in the register as the next instruction word address, and

a common bus (**101**) selectively interconnecting the source, the arithmetic section, the destination and the control means during every processor cycle for transferring the instruction word from the source to the control means, for transferring data words from the source to the arithmetic section, and for transferring the resultant data word from the arithmetic section to the destination.

4,598,359

APPARATUS FOR FORWARD OR REVERSE READING OF MULTIPLE VARIABLE LENGTH OPERANDS

Donald C. Boothroyd, Phoenix, and Robert W. Norman, Jr., Glendale, both of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

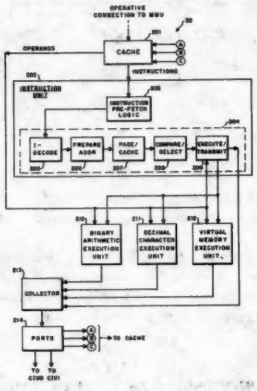
Filed Apr. 1, 1983, Ser. No. 481,225
Int. Cl.[4] G06F *12/04*
U.S. Cl. 364—200 **4 Claims**

1. An apparatus for reading information stored in a temporary storage memory, said temporary storage memory being organized to have a plurality of locations, each location having a corresponding address, and each location being divided into an odd portion and an even portion, each portion being individually accessible, said apparatus comprising:

(a) switch means for providing one of a plurality of preselected constants;

(b) register means for providing a read address signal corresponding to the location and the portion of the location, desired to be read, of said temporary storage memory; and

(c) adder means, operatively connected to said switch means and to said register means, for adding one of said preselected constants to said read address signal to generate a next read address signal specifying the desired location to be read on a next sequential cycle,



(i) the preselected constant chosen to be added being a first preselected constant resulting in the next read address signal specifying the next contiguous even portion or odd portion of the location in a forward direction, or

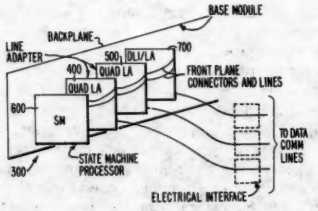
(ii) the preselected constant chosen to be added being toggled between a second and third preselected constant on alternative sequential cycles resulting in the next read address signal specifying the next contiguous even portion or odd portion of the location in a reversal direction.

4,598,360

READ CONTROL OPERATIONS SYSTEM FOR A MULTIPLE LINE ADAPTER ORGANIZATION

Richard A. Loskorn, Dana Point, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 372,106, Apr. 27, 1982, abandoned. This application Feb. 21, 1984, Ser. No. 580,292
Int. Cl.[4] G06F *1/00*
U.S. Cl. 364—200 **4 Claims**



1. In a data-comm subsystem wherein a line support processor controls data transfer operations between a host computer and remote data terminals, and said line support processor includes a plurality of line adapters, a data link interface unit

and a microprocessor, said microprocessor including program data in an internal PROM and in external RAM storage means and having an I/O bus and output control registers providing control data and information data to said line adapters, a Read-control system for communicating with said line adapters comprising:

(a) a plurality of line adapters, controlled by said microprocessor, and wherein each line adapter includes:

(a1) USART control component means for transmission of or reception of data between a remote terminal and said microprocessor;

(a2) timing means for setting baud rates of data transfers and for protocol timing signals;

(a3) gating means for sensing when said USART means or said timing means requests service, said gating means providing an interrupt signal to said microprocessor;

(a4) designate logic means for receiving control signals from said gating means and said microprocessor, for selecting a requesting USART means or timing means;

(b) driver-controller bus means for selecting either a data transfer path from said microprocessor to a selected USART means/timing means in a designated line adapter, or for selecting a data transfer path from a requesting USART means/timing means to a group of "n" multiplexors where n represents the number of bits in a byte of data whereby said group of "n" multiplexors provide a data path to said microprocessor via said I/O bus means;

(c) said microprocessor providing instruction signals to enable said gating means to activate a discrete bit line in said I/O bus, and including:

(c1) means to scan said I/O bus to identify the requesting line adapter via said activated bit line;

(c2) means to enable said driver-controller bus means to select a transfer path from a requesting USART/timing means to said group of multiplexors;

(c3) means to select a designated input line for each multiplexor in said group of multiplexors;

(c4) means to read out data from a requesting USART means/timing means;

(c5) said I/O bus means connecting the outputs of said "n" multiplexors to said microprocessor;

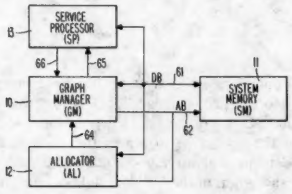
(d) a plurality of groups of multiplexors connected to said driver-controller bus wherein each group of n multiplexors provides n bits of output data from said requesting USART-/timing means for parallel transfer to said microprocessor on said I/O bus.

4,598,361

ALLOCATOR FOR A REDUCTION PROCESSOR EVALUATING PROGRAMS STORED AS BINARY DIRECTED GRAPHS EMPLOYING VARIABLE-FREE APPLICATIVE LANGUAGE CODES

Gary L. Logsdon; Mark R. Scheevel, and Frank A. Williams, Jr., all of Austin, Tex., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jan. 11, 1985, Ser. No. 690,846
Int. Cl.[4] G06F *1/00*
U.S. Cl. 364—200 **10 Claims**



1. In a processing system having a memory with a plurality of storage locations, each storage location having a mark bit position which when set indicates that the storage location has been allocated for use and when reset indicates that the storage location is available for use, allocation means comprising:

mark bit addressing means coupled to said memory to fetch in parallel mark bits from a plurality of sequential storage locations, said fetched mark bits forming a mark bit vector;

checking means coupled to said mark bit addressing means for checking said mark bit vector for reset marked bits; and

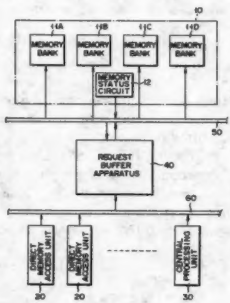
address formation means for forming addresses for those storage locations represented by the reset mark bits in said mark bit vector.

4,598,362

BUFFER APPARATUS FOR CONTROLLING ACCESS REQUESTS AMONG PLURAL MEMORIES AND PLURAL ACCESSING DEVICES

Morishige Kinjo; Jyun-ichi Kihara, and Keizo Aoyagi, all of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 21, 1983, Ser. No. 506,363
Claims priority, application Japan, Jun. 24, 1982, 57-108812
Int. Cl.[4] G06F *13/16*
U.S. Cl. 364—200 **13 Claims**



12. A request buffer apparatus for controlling a plurality of requests to a plurality of memory banks to be accessed which are commonly used by a plurality of accessing devices in a data processing system, comprising:

request buffer means having a plurality of buffers for storing access requests to said memory banks;

buffer status circuit means, coupled to said request buffer means, for indicating an empty status of said plurality of buffers;

buffer write address generating means, coupled to said buffer status circuit means, for generating addresses of said buffers which are empty as buffer write addresses in accordance with contents of said buffer status circuit means;

buffer read address generating means, coupled to said request buffer means and said buffer write address generating means, arranged for each of said memory banks, for storing buffer write addresses of said buffers, for storing an access request corresponding to a memory bank, and for generating as a buffer read address to said request buffer means a write address of a buffer storing an access request which is stored first when a buffer read request is received; and,

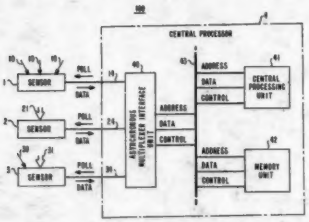
a control circuit, coupled to said buffer read address generating means and said request buffer means, for producing a buffer read request to said buffer read address generating means and a read command to said request buffer means, respectively, in accordance with a ready state of a memory bank.

4,598,363

ADAPTIVE DELAYED POLLING OF SENSORS

Larry L. Clark; Carmen E. DeArdo, and Barry A. Shaffer, all of Reynoldsburg, Ohio, assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 7, 1983, Ser. No. 511,742
Int. Cl.[4] G06F *13/00, 13/22*
U.S. Cl. 364—200 **13 Claims**



1. A method of polling sensors (1, 2, 3) receiving data intended for processing by a central processor (4) coupled with the sensors comprising the step of

polling (5) the sensors to collect and record the sensor data in sensor buffer stores (421, 422, 433) each associated with a sensor and each located in a memory unit (42) of the central processor

characterized in that

said polling step comprises the steps of

recording (51, 52, 53, 54, 58) in each sensor buffer store an adaptive time delay status controlling an interval of time between consecutive polls of the sensor associated with the sensor buffer store, and

dynamically regulating (55, 56, 57) said recorded time delay status in accordance with a proportional relationship of the received sensor data with the data capacity of the sensor buffer store associated with the sensor to optimize the data load offered by the sensors to the central processor.

4,598,364

EFFICIENT TRACE METHOD ADAPTABLE TO MULTIPROCESSORS

Peter H. Gum, Poughkeepsie; Arthur L. Levin, Pleasant Valley; Ronald M. Smith, Wappingers Falls, all of N.Y., and John H. Wilson, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1983, Ser. No. 509,129
Int. Cl.[4] G06F *11/30*
U.S. Cl. 364—300 **18 Claims**

1. A program tracing method for each CPU in a data processing system having at least one CPU, a main storage accessible to each CPU, each CPU having an instruction execution (IE) unit for executing instructions in programs dispatched for the CPU, the IE having control registers (CRs) and general purpose registers (GRs), the program tracing method comprising:

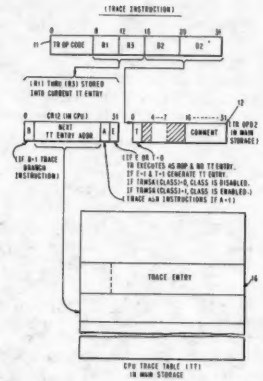
providing a tracing instruction having a particular operation code and one or more operands,

locating the tracing instruction at predetermined locations in a program,

decoding the operation code of each instruction received by the IE,

providing a unique-enablement field in an operand of each tracing instruction for controlling the operation of each individual tracing instruction independently of the operation of other tracing instructions located at different locations in the programs, the unique-enablement field being selectively set to a state which controls whether or not a trace-table entry is generated for each individual tracing instruction,

determining for the CPU a trace-table-entry address, the trace-table-entry address locating an available trace table entry for the CPU,



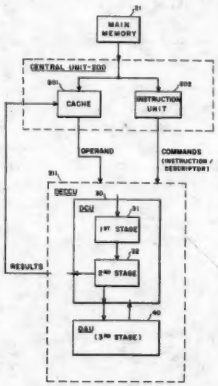
allowing the insertion of a trace-table entry in the CPU trace table for an executed trace instruction only when the unique-enablement field for an individual trace instruction being executed by the IE is set to an enabled state.

4,598,365

PIPELINED DECIMAL CHARACTER EXECUTION UNIT

Donald C. Boothroyd, Phoenix; Robert W. Norman, Jr., Glendale, and Howard J. Keller, Scottsdale, all of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Apr. 1, 1983, Ser. No. 481,224
Int. Cl.[4] G06F *9/38*
U.S. Cl. 364—200 **29 Claims**



1. In a data processing system, having a main storage element for storing programs and data utilized by a central processing unit (CPU) of said data processing system, said CPU executing the programs stored in the main storage element, said CPU being operatively connected to said main storage element, and wherein the CPU includes a central unit, a cache unit, and a plurality of execution units, including a decimal execution unit, the cache unit storing instructions and operands currently awaiting execution, the cache unit being operatively connected to the main storage element, and the central unit

performing predetermined initial operations on the instructions, the initial operations including fetching instructions from said cache unit, decoding the instructions, preparing the virtual address, paging and fetching the operand associated with the instruction and transferring the instruction to a predetermined one of the execution units, each execution unit performing the execution of a predetermined class of instruction, each execution unit being operatively connected to said cache unit for receiving operands and to said central unit for receiving instructions processed by said central unit, said decimal execution unit being a pipelined execution unit for executing decimal-type instructions, said pipelined execution unit comprising:

(a) first stage means, operatively connected to said central unit and to said cache unit, for temporarily storing input data, said input data including operation commands being received from said central unit defining said decimal type instructions, and said input operand data being received from said cache unit; and wherein said first stage means includes:

(i) first input buffer means for temporarily storing at least one operation command;

(ii) second input buffer means for temporarily storing input operand data associated with said temporarily stored operation command; and

(iii) switch means, operatively connected to said second input buffer means, for distributing said temporarily stored input operand data to a second stage means;

(b) second stage means, operatively connected to said first stage means, for executing a first predetermined group of said decimal type instructions;

(c) third stage means, operatively coupled to said second stage means, for executing a second predetermined group of said decimal type instructions, said second predetermined group including arithmetic type instructions; and

(d) fourth stage means, operatively connected to said second stage means and to said third stage means, for temporarily storing output data resulting from the execution of said operation commands.

4,598,366

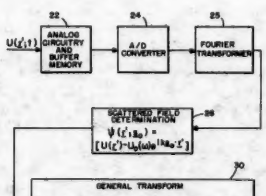
DIFFRACTION TOMOGRAPHY SYSTEMS AND METHODS WITH ARBITRARY SOURCE AND DETECTOR ARRAY SURFACES

Anthony J. Devaney, Ridgefield, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 441,323, Nov. 12, 1982, Pat. No. 4,562,540, and a continuation-in-part of Ser. No. 533,391, Sep. 19, 1983. This application Jan. 25, 1984, Ser. No. 573,540

Int. Cl.[4] **G01V** *5/00;* **G01N** *29/00;* **G06F** *15/42*

U.S. Cl. 364—400 **42 Claims**



1. A method for the tomographic reconstruction of an object which has diffracted waves of energy propagating through it, said waves of energy being selected from a group consisting of sonic and electromagnetic waves, comprising:

obtaining signals which are a function of at least one of the phase and amplitude of the diffracted propagating waves after said waves have interacted with said object, wherein the sources of said energy waves are located along an arbitrary curvilinear surface, other than a single straight line and the detectors of said diffracted waves are located along an arbitrary curvilinear surface other than a single straight line; and

converting said signals by means of a filtered backpropagation technique into an array representing a partial reconstruction of the object.

25. A method for the tomographic reconstruction of an object comprising:

directing, from energy sources located along an arbitrary curvilinear surface, waves of energy toward said object;

detecting as a function of time, with detectors located along an arbitrary curvilinear surface other than a single straight line, the fields produced by said waves;

producing signals which are functions of said detected fields;

preprocessing said produced signals; and

filtering said preprocessed signals according to a filtered backpropagation technique to generate an array representing a partial reconstruction of said object.

4,598,367

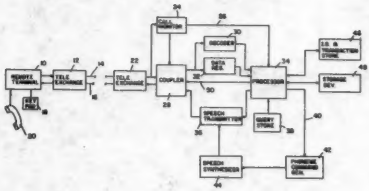
FINANCIAL QUOTATION SYSTEM USING SYNTHESIZED SPEECH

James DeFrancesco, Ellicott City, and Scott L. Freiman, Pikesville, both of Md., assignors to Financial Design Systems, Inc., Ellicott City, Md.

Filed Nov. 9, 1983, Ser. No. 551,130

Int. Cl.[4] **G06F** *15/20;* **G07G** *1/12;* **G10L** *5/02*

U.S. Cl. 364—408 **7 Claims**



1. A financial quotation system for audibly eliciting input information and for generating and transmitting a plurality of financial disclosure statement terms in accordance with identification information, control information, and financial input information sent by a user from a remote terminal which includes audio means for announcing speech and keying means for generating and sending said identification, control and financial input information, said identification information including a transaction I.D. signal identifying at least one financial transaction which along with said financial input information is the basis for producing said plurality of financial disclosure statement terms, said financial input information including at least one input variable representative of a financial value, and said control information including a control signal, said system comprising:

a call monitor coupled to said remote terminal for responding thereto and for producing a connect signal;

receiving means for receiving said identification information and said financial input information from said user located at said remote terminal;

synthesized speech means responsive to phoneme command signals for generating synthesized speech signals;

transmitting control means for generating a transmit control signal;

speech transmitting means coupled to said synthesized speech means, coupled to said transmitting control means and being responsive to said transmit control signal for sending said synthesized speech signals generated by said synthesized speech means to said remote terminal;

requesting means coupled to said call monitor and responsive to said connect signal for generating phoneme command signals and for supplying said phoneme command signals to said synthesized speech means for audibly eliciting said identification information and said financial input information from said user at said remote terminal;

verifying means for confirming said at least one input variable representative of said financial value by generating further phoneme command signals and supplying said further phoneme command signals to said synthesized speech means thereby to effect audible announcement of said at least one input variable received by the system so that the user may confirm the correctness of entry of said at least one input variable;

processing means coupled to said receiving means for processing said financial input information and said at least one input variable thereby to generate processed information and said plurality of financial disclosure statement terms representative of said financial disclosure statement based upon said transaction I.D. and said at least one input variable;

quoting means coupled to said processing means for generating additional phoneme command signals to said synthesized speech means thereby to effect audible announcement of a significant financial disclosure statement term which is one of said plurality of financial disclosure statement terms to said user located at said remote terminal; and,

a further quoting means coupled to said processing means for generating other phoneme command signals to said synthesized speech means upon receipt of said control signal thereby to effect audible announcement of said plurality of financial disclosure statement terms to said user.

4,598,368

SUPERPOSED IMAGE DISPLAY DEVICE

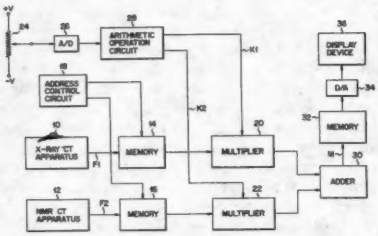
Yoshiyuki Umemura, Tochigi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 27, 1983, Ser. No. 565,469

Claims priority, application Japan, Dec. 27, 1982, 57-234028; Dec. 28, 1982, 57-233519; Dec. 28, 1982, 57-233537

Int. Cl.[4] **G06F** *15/42, 7/38;* **H04N** *5/32;* **G01T** *1/20*

U.S. Cl. 364—414 **11 Claims**



1. A device for displaying an image of an object comprising:

a first apparatus for generating a plurality of first image signals which each represent one of a plurality of picture elements comprising an image of said object obtained using a first imaging technique, said first apparatus including a first image signal pickup mechanism to obtain said first image signals;

a second apparatus for generating a plurality of second image signals which each represent one of a plurality of picture elements comprising another image of said object obtained using a second imaging technique, said second apparatus including a second image signal pickup mechanism which is separate and distinct from said first image signal pickup mechanism;

means for storing said first image signals at first address locations, with each first address location corresponding to the location in said object represented by the picture element corresponding to said first image signal stored at that first address location;

means for storing said second image signals at second address locations, with each second address location corresponding to the location in said object represented by the picture element corresponding to said second image signal stored at that second address location;

means for independently operating upon said stored first and second image signals;

means for simultaneously displaying each operated upon first and second image signal from first and second address locations corresponding to the same location in said object.

4,598,369

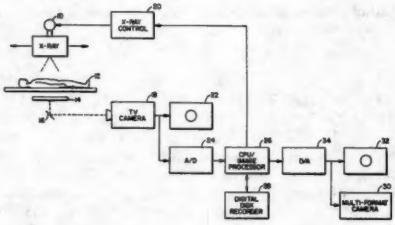
TOMOGRAPHY APPARATUS AND METHOD

Shih-Ping Wang, Los Altos, Calif.; Russell H. Morgan, Baltimore, Md., and Donald F. Specht, Los Altos, Calif., assignors to Picker International, Inc., Cleveland, Ohio

Filed May 2, 1983, Ser. No. 490,457

Int. Cl.[4] **G06F** *15/42;* **H04N** *5/32;* **G03B** *42/02;* **H05G** *1/60*

U.S. Cl. 364—414 **25 Claims**



1. A tomographic method comprising the steps of:

(a) using a radiation source to take a series of co-planar images of a subject from different, predetermined locations,

(b) forming first order clarified images for each of a plurality of parallel planes through the subject by shifting and superimposing the co-planar images for each such plane to cause all of the corresponding points in each such plane to be approximately coincident,

(c) for each one of a selected number of planes, forming smeared, first order clarified images by reproducing a predetermined number of times the first order clarified image for the selected plane, and superimposing each of said reproduced first order clarified images shifted in different positions in said selected plane as a function of the distance between the radiation source and said selected plane, the distance between said selected plane and the co-planar images, the same distances but with respect to a particular plane of interest, and the distances traveled by the radiation source in producing the series of co-planar images, and

(d) multiplying the smeared images by appropriate coefficients and then subtracting them from the first order clarified image of said particular plane of interest to form a second order clarified image of the particular plane of interest.

4,598,370

APPARATUS FOR CONTROL OF ACCELERATION AND DECELERATION DURING AUTO-CRUISE

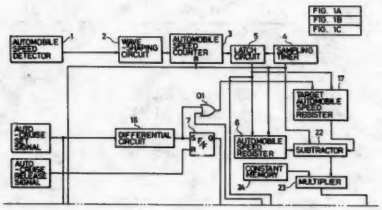
Tetsuo Nakajima, and Tomio Aoi, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 18, 1984, Ser. No. 571,891

Claims priority, application Japan, Jan. 27, 1983, 58-10521; Jan. 27, 1983, 58-10522

Int. Cl.[4] B60K *31/00*

U.S. Cl. 364—426 9 Claims



1. An apparatus for the control of acceleration of an automobile during the course of auto-cruise, comprising in combination:

means for sampling the real speed of the automobile at predetermined time intervals,

a first register for storing, in response to entry of an auto-cruise set signal, the real speed of the automobile which exists at the moment of entry of said set signal as a target speed,

means for finding as a first amount the deviation of said real speed of the automobile from said target speed,

means for computing an amount of compensation for throttle opening angle based on said deviation,

means for generating an acceleration signal during the course of auto-cruise,

an initial acceleration increment memory for storing an increment of throttle opening angle at the initial stage of acceleration based on the real speed of the automobile,

a timer for counting the duration of the acceleration signal,

an acceleration pattern memory for storing an increment of throttle opening angle based on the duration of the acceleration signal,

a post-acceleration decrement memory for storing a decrement of throttle opening angle after disappearance of the acceleration signal based on the real speed of the automobile,

means for reading as a second amount an increment of throttle opening angle for compensation of throttle position, said second amount being read out of said initial acceleration increment memory in response to issuance of the acceleration signal,

means for reading as a third amount an increment of throttle opening angle for compensation of throttle position, said third amount being read out of said acceleration pattern memory in response to said duration of the acceleration signal,

means for reading as a fourth amount a decrement of throttle opening angle for compensation of throttle position, said fourth amount being read out of said post-acceleration decrement memory in response to disappearance of the acceleration signal, and

means for controlling throttle position based on one of said first, second, third and fourth amounts for compensation of throttle opening angle.

4,598,371

IGNITION CONTROL DEVICE FOR AN INTERNAL COMBUSTION ENGINE

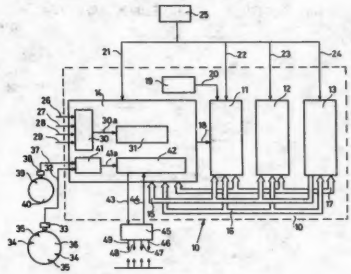
Giancarlo De Angelis; Renato Saglimbeni, both of Bollate, and Riccardo Mainardi, Milan, all of Italy, assignors to Alfa Romeo Auto S.p.A., Naples, Italy

Filed Jun. 15, 1983, Ser. No. 504,393

Claims priority, application Italy, Jun. 28, 1982, 22082 A/82

Int. Cl.[4] F02P *5/15*

U.S. Cl. 364—431.04 5 Claims



1. An ignition control device for a plural cylinder internal combustion engine having an ignition system incuding an ignition coil, of the microcomputer type comprising a programmed microprocessor (CPU), a read-only memory (ROM) containing calculation programs for said microprocessor and data tables necessary for calculations, a random access memory (RAM), and an input/output unit which are connected together and to said microprocessor by parallel interconnection lines (bus lines) for data, for addresses and for control signals, said input/output unit being operationally connected to sensors which sense preselected engine parameters, to first pulse generator means arranged to provide a pulse signal for each ignition to be effected in the engine, to second pulse generator means arranged to provide a pulse signal for each engine cycle, and to ignition coil actuator means, said input-/output unit comprising:

first timer means operationally connected to said microprocessor for receiving from said microprocessor a calculated quantity constituted by a delay time to be counted and said first timer means feeding a first interruption signal to said microprocessor at the end of the count of said first timer means, and said first timer means operationally connected to said first pulse generator means in such a manner as to be caused to initiate the counting of said delay time by said pulse signal, and said first timer means are further operationally connected to said actuator means for feeding an output signal which causes deactivation of said ignition coil at the end of the delay time count,

second timer means operationally connected to said microprocessor for receiving from said microprocessor the calculated quantity constituted by the pause time to be counted, in order to be caused to initiate the count of said second timer means after the arrival of said first interruption signal, said second timer means feeding a second interruption signal to said microprocessor at the end of the count of said second timer means, interface means operationally connected to said microprocessor for receiving said second interruption signal and operationally connected to said actuator means for feeding a signal which causes said ignition coil to conduct on the arrival of said second interruption signal, and

comparator means operationally connected to said ignition coil and to said second timer means for causing said second timer means to initiate the count of the time for which said ignition coil remains at maximum charge on exceeding the charge energy by a predetermined value, said

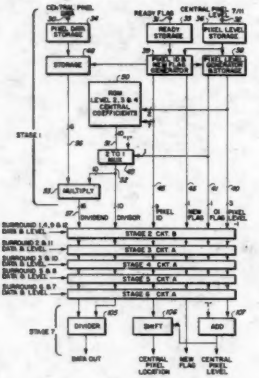
second timer means being caused by the microprocessor to terminate the count of said time of said ignition coil remaining at maximum charge on arrival of said first interruption signal.

4,598,372

APPARATUS AND METHOD OF SMOOTHING MAPS COMPRESSED IMAGE DATA

Louis A. McRoberts, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 28, 1983, Ser. No. 566,258
Int. Cl.[4] G06F *15/353*; H04N *5/14, 1/41*
U.S. Cl. 364—518 **9 Claims**



1. A method of smoothing MAPS compressed image data including video data and coefficients for a central block of pixels and video data and coefficients for a plurality of surround areas, said method comprising the steps of:

arranging coefficients for surround areas CS_1 through CS_i symmetrically so they are divided into at least two equal groups;

storing the coefficients of one of the equal groups in an order coinciding with the arranging step;

retrieving stored coefficients by accessing the stored coefficients in a first sequence for one of the equal groups and accessing the stored coefficients in an opposite sequence for the other of the equal groups; and

utilizing the retrieved coefficients and the video data to calculate the output value for any pixel (n) in the central block of pixels from the equation

$$Out_n = \frac{D \cdot C_n + DS_1 \cdot CS_1 + DS_2 \cdot CS_2 + DS_3 \cdot CS_3 \ldots DS_i \cdot CS_i}{C_n + CS_1 + CS_2 + CS_3 \ldots CS_i}$$

Where:

D=video data for the central block,

C_n=coefficient for the central block,

DS_i=video data for the surround areas 1 through i, and

CS_i=coefficient for the surround areas 1 through i;

and

applying the calculated output value to display apparatus to produce an image from the compressed image data.

6. Apparatus for smoothing MAPS compressed image data including video data and coefficients for a central block of pixels and video data and coefficients for a plurality of surround areas, said apparatus comprising:

addressble memory means having stored therein coefficients for the plurality of surround areas, the coefficients being arranged symmetrically so they are divided into two equal groups with the coefficients for one of the equal groups being stored in said memory means;

address generating means connected to said addressable memory means for generating binary numbers the least significant bits of which are the address of the stored coefficient being accessed and the most significant bit of which determines the equal group being accessed: and

circuitry connected to said memory means and said address generating means for calculating the output values for any pixel (n) in the central block of pixels from the equation

$$Out_n = \frac{D \cdot C_n + DS_1 \cdot CS_1 + DS_2 \cdot CS_2 + DS_3 \cdot CS_3 \ldots DS_i \cdot CS_i}{C_n + CS_1 + CS_2 + CS_3 \ldots CS_i}$$

where:

D=video data for the central block,

C_n=coefficient for the central block,

DS_i=video data for the surround areas 1 through i, and

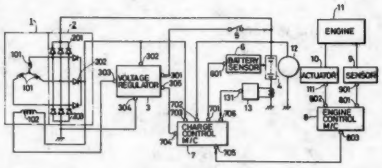
CS_i=coefficient for the surround areas 1 through i;

4,598,373

CHARGE CONTROL MICROCOMPUTER DEVICE FOR VEHICLE

Mitsuharu Morishita, and Shinichi Kouge, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1983, Ser. No. 495,543
Claims priority, application Japan, May 18, 1982, 57-85207
Int. Cl.[4] H02H *7/14*; G06F *15/56*
U.S. Cl. 364—424 **5 Claims**



1. A charge control microcomputer device for a vehicle, comprising:

an AC generator driven by an internal combustion engine installed on a vehicle, said generator having a field coil and armature coils;

a battery charged by a rectified output of said generator;

a starter motor driven by said battery, for starting said engine;

a voltage regulator for controlling the current flowing in said field coil, to control an output voltage of said generator to a predetermined value;

a battery sensor for detecting at least one of a solution temperature, specific gravity or acidity of said battery;

a charge-discharge current sensor for detecting a charge or discharge current of said battery;

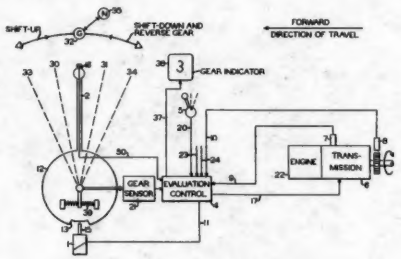
an engine controlling microcomputer for processing engine data; and

a charge controlling microcomputer for processing, storing and reading data from said battery sensor, data from said charge-discharge current sensor, generated voltage data from said generator, battery terminal voltage data, and engine data from said engine controlling microcomputer, to produce a reference voltage signal to provide said predetermined value for said voltage regulator.

4,598,374
GEARSHIFT SELECTION SYSTEM FOR A POWER-ASSISTED TRANSMISSION

Alfred Klatt, Wathlingen, Fed. Rep. of Germany, assignor to WABCO Westinghouse Fahrzeugbremsen GmbH, Hannover, Fed. Rep. of Germany

Filed Sep. 26, 1983, Ser. No. 535,485
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1982, 3237508
Int. Cl.⁴ G05G *5/04;* **F16H** *57/06, 5/80*
U.S. Cl. 364—424.1 **14 Claims**



14. A gearshift control arrangement comprising, a gearshift lever means connected to a gear sensor means, said gear sensor means connected to an evaluation control circuit means, said evaluation control circuit means connected to a power-assisted transmission which is driven by an internal combustion engine, a first sensor means for measuring the output speed of said power-assisted transmission, a second sensor means for monitoring which gear of said power-assisted transmission is presently engaged, signals representing the prevailing driving conditions fed to said evaluation control circuit means, said evaluation control circuit means connected to a stopping means which limits the movement of said gear-shift lever means between a shift-up position and a shift-down position and causing said power-assisted transmission to engage an optimum gear in accordance with the prevailing driving conditions when said gearshift lever means is moved to the shift-up and shift-down positions and for unlatching said stopping means for permitting said gearshift lever means to be moved beyond the shift-up and shift-down positions to acknowledge engagement of the optimum gear.

4,598,375
TIME MEASURING CIRCUIT

Tadao Hiramatsu, and Sunao Katayama, both of Aichi, Japan, assignors to Hagiwara Denki Kabushiki Kaisha, Nagoya, Japan

Filed Apr. 22, 1983, Ser. No. 487,918
Int. Cl.⁴ G04F *10/00*
U.S. Cl. 364—569 **6 Claims**

1. A time measuring circuit for meters of the pulse reflection type including a pulse oscillator means for applying a transmission pulse signal to an object to be measured, a receiving amplifier for receiving an echo pulse signal reflected from said object, a gate signal generator connected to said oscillator means and said amplifier to receive the transmission pulse signal and the echo pulse signal so as to produce a gate pulse signal the duration of which is proportional to a time interval between the pulse signals to be measured, and measuring means for measuring the duration of the gate pulse signal;

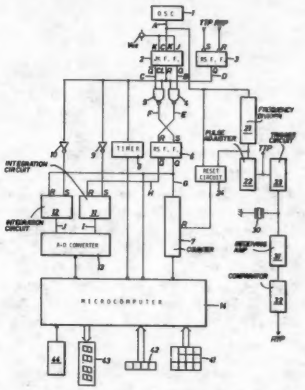
wherein the improvement comprises:

first means for producing first and second output pulses at a predetermined frequency during appearance of the gate pulse signal;

second means for counting the first output pulses from said first means and for producing an output signal indicative of the counted value;

third means responsive to the first and second output pulses from said first means for converting the duration of the gate pulse signal into the corresponding voltage value; and

fourth means for converting the finally converted voltage



value into the corresponding digital value and for producing an output signal indicative of the digital value; and

wherein said measuring means is arranged to measure a sum of the counted value and the digital value in response to the output signals from said second and fourth means.

4,598,376
METHOD AND APPARATUS FOR PRODUCING CUSTOM MANUFACTURED ITEMS

James O. Burton, Cleveland Heights; Timothy S. Adam, Garfield Heights; Frank W. Budziak, Cleveland, and Michael W. Nekoloff, Parma, all of Ohio, assignors to Richman Brothers Company, Cleveland, Ohio

Filed Apr. 27, 1984, Ser. No. 604,982
Int. Cl.⁴ G06F *15/46*
U.S. Cl. 364—470 **21 Claims**

16. A method for automated pattern grading and manufacture of an item of apparel comprising the steps of:

measuring a subject and recording specified measurements;

determining if said specified measurements require alterations of pattern points that define the standard graded item of apparel;

if the specified measurements do require an alteration, calculating modified positions for one or more pattern points whose relative position are affected by the alteration;

storing both modified and unmodified pattern point positions to define a custom item of apparel; and

directing an automated fabric cutter to cut at least one layer of fabric along a path defined by the modified and unmodified pattern point positions.

4,598,377

METHOD OF CONTROLLING THE ROLLING EFFICIENCY IN HOT ROLLING

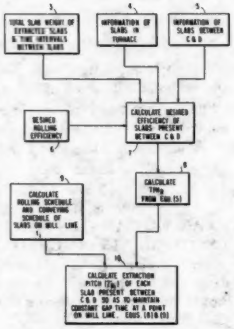
Kiyoshi Takagi; Ichiro Toda, both of Okayama; Yoshiharu Hamasaki, and Yoshinori Wakamiya, both of Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha and Kawasaki Steel Corporation, both of, Japan

Filed Sep. 30, 1982, Ser. No. 431,927

Claims priority, application Japan, Oct. 5, 1981, 56-158431

Int. Cl.[4] G06F *15/46*; B21B *27/06, 37/00*

U.S. Cl. 364—472 **2 Claims**



1. A method of controlling the rolling efficiency in a continuous hot rolling process, comprising the steps of:

sequentially charging into a heating furnace a plurality of slabs at a charging point;

sequentially extracting from said heating furnace said charged slabs;

inputting a total weight of and the time intervals of slabs already extracted from said heating furnace in a past period extending from a predetermined previous time up to the present time, a total weight and a forecast furnace residence time of slabs charged in said heating furnace and a total weight of any number of slabs to be charged;

calculating a desired rolling efficiency of said slabs to be charged to thereby control the overall average rolling efficiency to a predetermined value while keeping constant a time gap TG_M between successive slabs at a predetermined position downstream from said charging point; and

calculating said time gap according to the equation:

$$TG_M = \frac{1}{n_R}\left(\frac{W_M}{TPH_M} - \sum_{i=1}^{n_R} t_i\right),$$

wherein TPH_M is the rolling efficiency in said past period, n_R is the number of slabs, having a total weight W_M, located between two predetermined points, and t_i is a rolling time for the i-th of said n_R slabs.

4,598,378

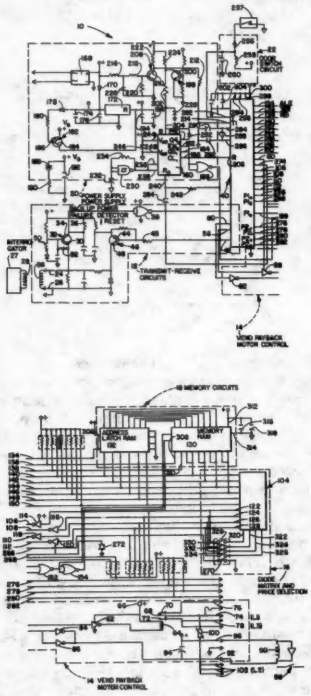
MANAGEMENT INFORMATION SYSTEM AND ASSOCIATED VENDING CONTROL DEVICE

Harlan R. Giacomo, St. Louis County, Mo., assignor to H.R. Electronics Company, St. Louis, Mo.

Filed Feb. 7, 1983, Ser. No. 464,718

Int. Cl.[4] G07F *11/00*

U.S. Cl. 364—479 **23 Claims**



1. In combination a vend circuit for a vending machine and means to accumulate an ongoing history of the operation of the vending machine including an ongoing history of sales, service, and machine down time, the vend circuit having switch means operable to distinguish between when the vending machine door is open and the vending machine is being services and when the vending machine door is closed comprising a vending control circuit including:

means to respond to the deposit of credit in the vend machine including means to accumulate a total thereof taking into account vending, paying back or refunding operations,

means to cause a vend to take place when the amount deposited at least equals the price of a selected vend,

means including a diode matrix circuit having diodes arranged in rows and columns and having first and second portions,

switch means operatively connected to the first portion of the diode matrix for establishing therewith a vend price for the vending machine;

other circuit means operatively connected to the second portion of the diode matrix for addressing the second portion thereof;

means to payback any excess deposited over the cost of the selected vends,

means including programable memory means operatively connected to the vend control circuit to accummulate an ongo-

ing history of the operation of the vending machine including;

means responsive to the means to accumulate a total of the deposit of credit to keep a running accumulation of net sales from the vending machine,

means responisve to the means operable to distinguish between when the vending machine is being serviced including means to keep a record thereof,

means responsive to the condition of the door switch means on the vending machine to distinguish whether the door to the vending machine is open or closed to produce changes in the control circuit which enable the vend control circuit to distinguish between vend operations made when the door is open and when it is closed,

and means to prevent the loss of accumulated information under conditions when there is an interruption in power to the vend control circuit, said means including a main source of power for operating the vending machine, an internal source of power including means operatively connecting the main source of power to the internal source to maintain a charge thereon during operation of the vending machine by the main source of power and timer means, first means responsive to an interruption in power from the main power source including means to disable the programmable memory means and to initiate the timer means to produce a timer interval of predetermined duration, and second means for resetting the vend control circuit at the conclusion of the time interval.

4,598,379

CONTROL SYSTEM OF AN AUTOMATIC VENDING MACHINE

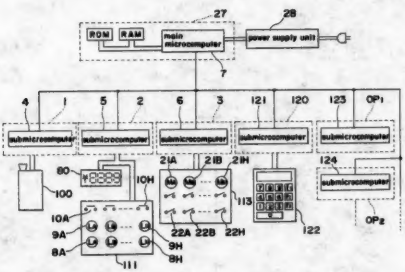
Misao Awane; Seiji Hara, and Satoshi Kobayashi, all of Saitama, Japan, assignors to Sanyo Electric Co., Ltd. and Tokyo Sanyo Electric Co., Ltd., both of, Japan

Filed Nov. 10, 1983, Ser. No. 550,916

Claims priority, application Japan, Nov. 12, 1982, 57-199268; Nov. 12, 1982, 57-199269; Nov. 19, 1982, 57-203942; Nov. 19, 1982, 57-203943; Nov. 19, 1982, 57-203944; Nov. 27, 1982, 57-208280

Int. Cl.[4] G07F *11/00*

U.S. Cl. 364—479 **9 Claims**



8. A control system, of an automatic vending machine for selling articles, including:

front panel unit having money amount displays, sold-out displays disposed in accordance with article types to display sellout of said articles, and selection switches provided in accordance with said types of said articles, coin mechanism having a coin detector means for selecting an inserted coin to generate an inserted coin signal upon detection of a proper coin, change payment means for paying change for small change use, change detector means for detecting presence of coin needed for change use, vending apparatus having an article delivery apparatus for discharging selected articles and a sold-out switch for detecting whether or not said article is available, customer unit for interfacing with said customer,

main microcomputer for transmitting select codes for specifying a part of said vending machine communicated with and instruction code data respectively to the customer unit, the coin mechanism and said vending apparatus,

at most four common signal lines for carrying serial transmission of select code and command data respectively between to the front panel unit, the coin mechanism, the vending apparatus and main microcomputer,

first sub-microcomputer provided in said customer unit for controlling display operation of said money amount display and said sold-out displays, for detecting the operation of said selection switch by a customer, and is coupled to said main microcomputer through said signal line for communication with said main microcomputer, said first sub-microcomputer including:

means for producing selected commodity data respresenting the types of said selected articles through detection of operation of said selection switch by said customer,

decoding means for decoding the select code and the command data transmitted from the main microcomputer,

transmitting/receiving means for an on-line mode when said select code transmitted from said main microcomputer corresponds to said front panel unit, transmits selected commodity data serially through said signal line in response to command data indicating a transmission request of said selected commodity data to said main microcomputer, and receives data, indicating one of inserted money amount, remaining money amount after sales, and sold out article calculated by said main microcomputer, transmitted serially through said signal line from said main microcomputer in response to input of command data indicating the reception request of data,

means for displaying received money amount data onto and money amount display, and

means for displaying on said sold-out display the sold-out article to be shown by the received sellout data,

a second sub-microcomputer in said coin mechanism for detecting an inserteed coin signal produced in said coin detector through an inserting operation of a proper coin by a customer, for detecting said change detector whether or not paying change is available, for controlling change delivery operation by said change payment unit, and is coupled to said main microcomputer through said signal line for communication with said main microcomputer, said second sub-microcomputer including:

inserted coin signal input means for inputting the inserted coin signal produced in said coin detector,

detecting means for detecting existence of change by said change detector,

select code decoding means for decoding select code and command data transmitted from said main microcomputer,

transmitting/receiving means for transmitting data serially to said main microcomputer through said signal line in response to input of command data indicating a transmission request to said main microcomputer with respect to data indicating said inserted coin or existence of said remaining coin and for receiving paying data indicating change-to-be-paid serially transmitted from said main microcomputer in response to input of command data showing reception request of said data in on-line mode when said select code transmitted from the main microcomputer corresponds to said coin mechanism, and

means for controlling said change payment unit so that said change may be paid in accordance with payment data received,

a third sub-microcomputer provided in said vending apparatus for controlling article delivery operation of said article delivery apparatus for detecting availability of said selected article according to said sellout switch, coupled to said main microcomputer through said signal line for communication

with said main microcomputer, said third sub-microcomputer including:

detecting means for detecting whether or not sold articles exist according to said sellout switch to produce sold-out data,

decoding means for decoding said select code and said command data to be transmitted from said main microcomputer,

transmitting/receiving means for transmitting said sold-out data serially to said main microcomputer through said signal line in response to an input of said command data indicating transmission request of said sold-out data to said main microcomputer, and for receiving sale commodity data indicating kinds of selling articles to be transmitted serially from said main microcomputer in response to input of command showing the reception request of data, in an on-line mode when said select code data transmitted from said main microcomputer corresponds to said data from said selling apparatus, and

controlling means for controlling said vending apparatus so that an article selected by a customer is delivered through said received sale commodity data,

said main microcomputer further including:

memory means having a price of each article stored therein in accordance with types of said articles,

calculating means for calculating inserted money amount from data indicating said inserted coin,

money amount means for calculating remaining money amount after the sale of said article,

comparing means for comparing one of said inserted money amount and said remaining money amount and respective article prices and determining said article purchasable by said customer in accordance with data showing existence of change and sold-out data,

transmitting means for transmitting sale commodity data showing the sales of said article to said third sub-microcomputer when an article selected by a customer, indicated by said selected commodity data received from said first sub-microcomputer, is purchasable,

inserted money amount transmitting means for transmitting one of said inserted money amount calculated and said money amount data showing remaining money amount, and

payment data producing means for producing payment data in accordance with said remaining amount money during said change payment operating for transmitting said data to said second sub-microcomputer.

4,598,380

METHOD AND APPARATUS FOR CONTROLLING MANIPULATOR AND WORKPIECE POSITIONER

John G. Holmes; Elena R. Messina; Brian J. Resnick, and Charles C. Teach, all of Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Aug. 13, 1984, Ser. No. 640,431

Int. Cl.[4] **G06F** *15/46;* **G05B** *19/42*

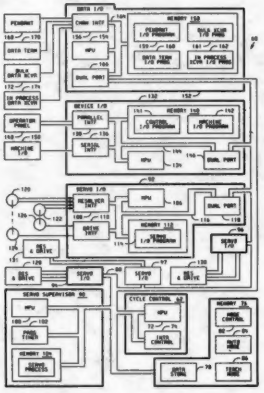
U.S. Cl. 364—513 **27 Claims**

1. Method for cooperatively controlling motion of a tool centerpoint associated with the function element carried by a manipulator and rotation of a workpiece carried by a positioner, the motion effected by the manipulator being along a linear path intersecting the axis of rotation of the workpiece, the motion being defined by input signals, the manipulator and positioner having movable members driven by actuators controlled by servomechanism circuits, the relative motion of the tool centerpoint and workpiece surface being effected at a velocity represented by an input signal, the method comprising the steps of:

a. iteratively producing incremental velocity signals in response to the input signals, each incremental velocity signal representing the velocity of the tool centerpoint during an iteration interval;

b. modifying the incremental velocity signals in proportion to the change in radial distance of the tool centerpoint from the axis of rotation of the workpiece between successive iterations;

c. producing intermediate location coordinate signals in response to the modified incremental velocity signals, the intermediate location coordinate signals representing coordinates relative to a rectangular coordinate system associated with the manipulator of an intermediate location along the linear path of the tool centerpoint and an intermediate rotation of the workpiece; and



d. applying the intermediate location coordinate signals to the servomechanism circuits to effect coordinated motion of the movable members of the manipulator and positioner.

4,598,381

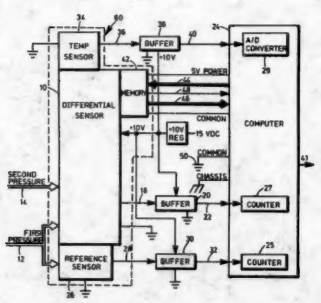
PRESSURE COMPENSATED DIFFERENTIAL PRESSURE SENSOR AND METHOD

Gerald R. Cucci, Minneapolis, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Filed Mar. 24, 1983, Ser. No. 478,504

Int. Cl.[4] **G01C** *25/00;* **G01N** *7/00;* **G01L** *25/00*

U.S. Cl. 364—558 **38 Claims**



1. Apparatus for sensing a difference in pressure between a first pressure and a second pressure and providing an output signal representative of the difference in pressure, the apparatus comprising:

differential pressure sensing means for providing a differential sensor signal representative of the difference in pressure between the first and second pressures;

reference pressure sensing means for providing a reference sensor signal representative of the first pressure;

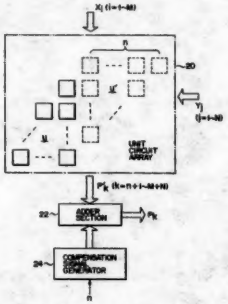
memory storage means for providing correction data for known errors in the reference sensor signal and the differential sensor signal; and

correcting means for providing the output signal as a function of the reference sensor signal, the differential sensor signal and the correction data, the output signal being more representative of the difference in pressure than is the differential sensor signal as a result of correction for known errors in both the reference sensor signal and the differential sensor signal.

4,598,382
MULTIPLYING CIRCUIT

Tai Sato, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Aug. 10, 1983, Ser. No. 521,656
Claims priority, application Japan, Sep. 16, 1982, 57-161220
Int. Cl.[4] G06F *7/52, 7/38*
U.S. Cl. 364—757 **2 Claims**



1. A multiplying circuit comprising:

array circuit means for producing a binary signal corresponding to at least (n+1)-th bits of a product of a multiplicand and multiplier by adding partial products together each having a multiplicand bit and a multiplier bit, where n is any positive integer which is not greater than the smaller one of the bit number of the multiplicand and the bit number of the multiplier;

means for producing a binary compensation signal representing an integral value corresponding to a real number given by

$$(n-1)+(1/2^n)/2;$$

and

means for adding the binary signal produced from said array circuit means and the binary compensation signal.

4,598,383
COMBINATION OF A DATA PROCESSOR WITH A SWITCH MEANS

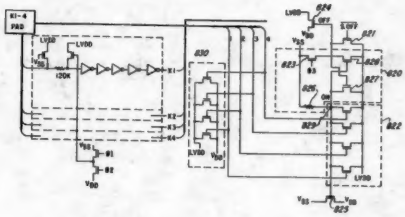
Jerald G. Leach, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 334,850, Dec. 28, 1981, abandoned. This application Feb. 29, 1984, Ser. No. 584,682
Int. Cl.[4] G06F *1/00*
U.S. Cl. 364—900 **3 Claims**

1. In combination, a data processor means for processing of data and having a clock means for providing a clock pulse when power is applied to the processor means, input means for inputting data, in the form of at least one digital pulse, to the processor means, output means for outputting the process data, and a switch means for providing power to the processor means, the switch means comprising:

first circuit means operably connected to the input means and responsive thereto for momentarily conducting power to the data processor means when the digital pulse is present and for removing power from the data processor means when the digital pulse is not present;

a latch means, having a "set" and "reset" state for preventing power consumption by the data processor means and



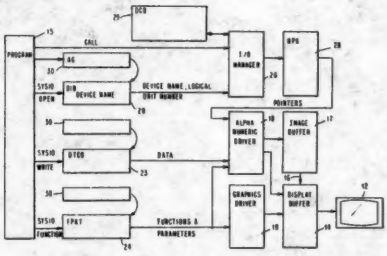
the switch means when the latch means is in the "reset" state and to provide power to the processor means and the switch means when the latch means is in the "set" state, the latch means being connected to receive the clock pulse and is set to the "set" state by the clock pulse; and

second circuit means operably connected to the latch means and responsive to an "off" signal for placing the latch means in the "reset" state after the latch means is placed in the "set" state.

4,598,384
GRAPHICS DISPLAY WITH IMPROVED WINDOW ORGANIZATION

Jerry C. Shaw, Ridgefield, and Theodore G. VanKessel, Bethel, both of Conn., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Apr. 22, 1983, Ser. No. 487,660
Int. Cl.[4] G06F *3/14*; G09G *1/06*
U.S. Cl. 364—900 **1 Claim**



1. In a data processing system of the type having a display, a buffer memory for holding a pattern to be presented on the display, a processor memory for holding programs of an operating system and user programs, and a processor for executing the programs simultaneously, a system for operating on the display screen within more than one window, an improved system for operating with multiple windows that are independent in sizes and locations comprising,

means in the operating system for establishing a plurality of control blocks (DIB) wherein each control block (DIB) contains a parameter (DIBVOL) that identifies a graphic device, such as a window, to be opened with the user program whereby the number of graphic devices to be opened within each user program is dynamically defined

by said user program with each user program defining at least two graphic devices,

means for establishing for each said window a parameter (LUN) uniquely identifying each said window within each said user program thereby allowing each said window to be independent of other windows within said user program,

means (I/0 manager) for establishing for each said window a control block (DCB) containing said identifying parameter (LUN) and containing a pointer to a driver associated with the device to be opened,

means for forming for each said window a function packet specifying a predetermined area of the screen as a window for operations identified by said uniquely identifying parameter and other function packets containing one or more functions to be performed within said window and optionally containing parameters,

a drvier program including means for fetching from the user program said function packets and means for executing said function packets to provide a display within the window identified by said parameter.

4,598,385

DEVICE FOR ASSOCIATIVE SEARCHING IN A SEQUENTIAL DATA STREAM COMPOSED OF DATA RECORDS

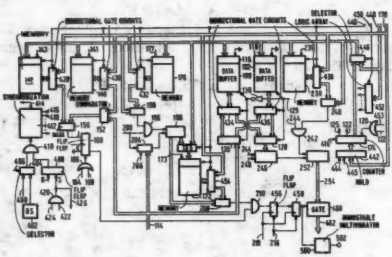
Jozef L. W. Kessels; Wijnand J. Schoenmakers, and Hendrik Vrielink, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 299,749, Sep. 8, 1981, abandoned. This application May 17, 1984, Ser. No. 611,911

Claims priority, application Netherlands, Sep. 12, 1980, 8005136

Int. Cl.[4] G06F *7/22*

U.S. Cl. 364—900 **6 Claims**



1. A data base processor for processing a sequence of data records each of up to a multibyte maximum length, said processor comprising:

a. a first input for at least byte-wide receiving the bytes of a data record from a background memory;

b. a one input, two output selector, fed by said first input for selectively connecting said first input to one of the selector outputs;

c. a two section data buffer, each of the two sections fed by an associated one of the two selector outputs and each section having storage capacity for storing a data record, said data buffer having a control element for selectively controlling the section connected to said first input in a write mode and the other section in a read mode;

d. a reference memory for storing a reference record and having a storage capacity equal to said multibyte maximum length;

e. a mask memory for storing a mask record and having a storage capacity equal to said multibyte maximum length;

f. an address generator for addressing in parallel said two sections, said reference memory and said mask memory with mutually equal addresses;

g. a first comparison element for bitwise and bytewide comparing, under control of an associated mask bit of the mask record read from the mask memory, a data bit received on said first input with an associated reference bit of the reference record read from the reference memory, said first comparison element having a first result output for outputting a mismatch bit upon detection of a mismatch condition;

h. a second comparison element for bitwise and bytewide comparing a plurality of data bits received on said first input with a plurality of multibit reference data in parallel, said second comparison element comprising selection means connected to said first input for selecting said plurality of data bits from a data record received, a membership memory (172) having an address input connected to an output of said selection means for receiving said plurality of data bits in parallel, said membership memory having a first data content on any location addressable by a d-ata byte equal to one of said multibit reference data, and a second data content on any other location, said first data content upon addressing giving a first "correct" signal;

i. a bistable indicator element having a set input for receiving a set signal which sets the bistable indicator element to a "provisionally correct" state upon transition from a data record in said sequence to a next successive record in said sequence, and a reset input connected to said result output to reset said bistable indicator element to an "incorrect" state upon reception of said mismatch bit;

j. interchange means connected to said control element for alternating said read and write modes between said two sections at least upon detecting said transition in combination with either the prevailing "provisionally correct" state indicating a match condition signal for the preceeding data record or upon detecting said first "correct" signal for the data record received in said data buffer most recently;

k. a two input, one output multiplexer fed by said two sections for selectively outputting a data record addressed by said address generator in a read operation under control of said first "correct" signal and said match condition signal.

4,598,386

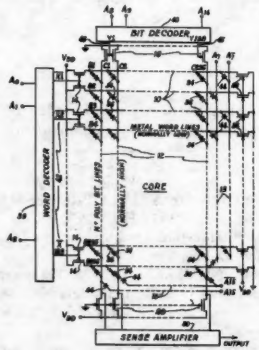
REDUCED-AREA, READ-ONLY MEMORY

Bruce B. Roesner, 18737 Lunada Point, San Diego, Calif. 92128, and William L. Hays, 473 Coronado Hills Dr., San Marcos, Calif. 92069

Filed Apr. 18, 1984, Ser. No. 601,510

Int. Cl.[4] G11C *17/00, 11/36*

U.S. Cl. 365—105 **10 Claims**



2. An improved integraged-circuit, read-only memory, including programmable read-only memory, having a plurality of parallel word lines, a plurality of parallel bit lines, the bit

lines being perpendicular to the word lines, each bit and word line being selectable by its own line-driving transistor, the word line-driving transistors being driven by word address lines as expanded by a word decoder, and the bit line-driving transistors being driven by bit address lines as expanded by a bit decoder, wherein the improvement comprises;

a. a word decoder driven by one less than all of the word address lines, each word decoder output driving two adjacent word line-driving transistors;

b. two auxiliary bit lines driven by the true and complement of the word address line that is not driving the word decoder;

c. circuitry means located at the crossover of each of the word lines and the appropriate auxiliary bit line, and connected between the lines to selectively suppress, according to the logical state of the auxiliary bit lines, the selection of one word line of each pair of word lines that is driven by a single word decoder output;

d. a bit decoder driven by one less than all of the bit address lines, each bit decoder output driving two adjacent bit line-driving transistors;

e. two auxiliary word lines driven by the true and complement of the bit address line that is not driving the bit decoder; and

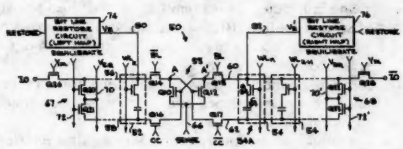
f. circuitry means located at the crossover of each of the bit lines and the appropriate auxiliary word line, and connected between the lines the selectively suppress, according to the logical state of the auxiliary word lines, the selection of one bit line of each pair of bit lines that is driven by a single bit decoder output.

4,598,387

CAPACITIVE MEMORY SIGNAL DOUBLER CELL

Patrick T. Chuang, and George Marr, both of Cupertino, Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 29, 1983, Ser. No. 537,319
Int. Cl.[4] G11C *11/24*
U.S. Cl. 365—149 **10 Claims**



1. A read-write capacitive memory circuit, comprising:

a plurality of capacitive memory elements each coupled between one-half of a halved bit line and a corresponding one-half of a halved return line;

cross-coupled sense amplifier means arranged to operate in a race mode between the two bit line halves; and

means for coupling the return line half corresponding to a one of the two bit line halves to the other of the two bit line halves.

4,598,388

SEMICONDUCTOR MEMORY WITH REDUNDANT COLUMN CIRCUITRY

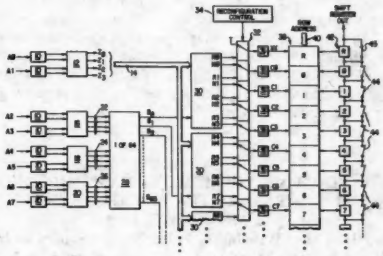
Daniel F. Anderson, Richmond, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 22, 1985, Ser. No. 693,417
Int. Cl.[4] G11C *7/00*; G06F *11/00*
U.S. Cl. 365—200 **17 Claims**

1. A defect tolerant memory, comprising:

primary memory means having an array of memory elements arranged in rows and columns, each column of memory elements selected by a column address signal and each row of memory elements selected by a row address signal;

redundant memory means having a plurality of memory elements arranged in a column for replacing a defective one of the column of memory elements in said primary memory means, said redundant memory means having a predetermined physical relationship relative to the columns in said primary memory means and selected by a predetermined one of said column address signal, the memory elements therein selected by one of said row address signals;



said redundant memory means normally inactive;

deactivating means for deactivating a defective one of the columns in said primary memory means; and

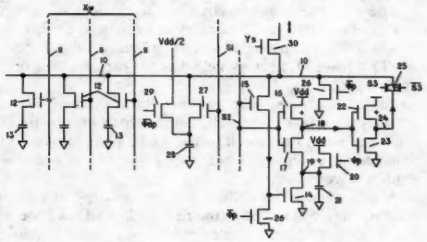
reconfiguring means for activating said redundant memory means and reconfiguring said associated column addresses of the columns in said primary memory means such that said predetermined column address is associated only with said redundant memory means and the one of said column addresses associated with the defective one of the columns in said primary memory means is associated with another column therein.

4,598,389

SINGLE-ENDED CMOS SENSE AMPLIFIER

Charvaka Duvvury, Missouri City, and Russel W. Strawn, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 1, 1984, Ser. No. 656,283
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—208 **9 Claims**



1. A memory device comprising:

an array of rows and columns of memory cells, a row line for each row of cells and a column line for each column of cells; each memory cell having an access transistor including a drain, a source-to-drain path, and a gate; the drain of each cell in a column being connected to said column line for the column and the gate of each cell being connected to said row line for the row,

a plurality of single-ended sense amplifier circuits, one for each column, each one of said sense amplifier circuits being connected to a separate one of said column lines,

each sense amplifier circuit including a detector circuit responsive to a given threshold voltage, the detector circuit having an input coupled to said column line for the respective volumn through a first coupling means, and an output from the detector circuit connected back to said column line through second coupling means,

precharge means for precharging the column lines to a selected voltage prior to the beginning of an active cycle,

dummy cell means for coupling a selected charge to each said column line at said beginning of an active cycle, said selected charge producing a voltage on said column line above said threshold if a 1 is stored in a selected memory cell, and below said threshold if a 0 is stored,

row addressing means for applying an activating voltage to the gates of said access transistors in a selected row by one of said row lines at said beginning of an active cycle,

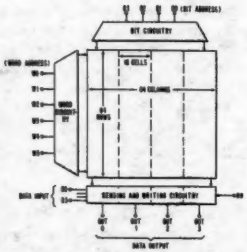
and means for activating said first and second coupling means in sequence with a time delay after said beginning of an active cycle.

4,598,390

RANDOM ACCESS MEMORY RAM EMPLOYING COMPLEMENTARY TRANSISTOR SWITCH (CTS) MEMORY CELLS

Yuen H. Chan, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 25, 1984, Ser. No. 624,489
Int. Cl.[4] G11C *13/00, 11/40*
U.S. Cl. 365—230 **23 Claims**



9. In a monolithic random access memory for storing binary data, said memory comprising:

an array of memory cells having m columns and n rows, where m and n are positive integers, and said memory array including m×n memory cells, where each of said cells has the capacity to store one binary bit and each of said n rows of memory cells has the capacity to store m binary bits;

m pairs of bit lines, each pair of said m pairs of bit lines including a first bit line BL and a second bit line BR;

n pairs of word lines, each pair of said n pairs of word lines including an upper (word) word line WL and a lower (drain) word line DL;

each of said memory cells of said m×n array of memory cells being connected to the first bit line BL and the second bit line BR of a predetermined one of said m pairs of bit lines;

each of said memory cells of said m×n array of memory cells being also connected to the upper (word) word line and the lower (drain) word line of a predetermined one of said n pairs of word lines;

m bit select circuits, each of said m bit select circuits being connected to a discrete one of said m pairs of bit lines;

a switchable bit up-level clamp circuit, said switchable bit up-level clamp circuit having an output terminal connected to each of said m bit select circuits;

bit address decoder circuit means, said bit address decoder circuit means having a plurality of select lines coupled to said m bit select circuits for selecting at least one of said bit select circuits; and

word line decoder circuit means, said word line decoder circuit means coupled to said n pairs of word lines for selecting one of said n pairs of word lines, said word line decoder having a first level of circuitry for receiving a word address and a second level of circuitry connecting said first level of circuitry to said n pair of word lines, whereby the operation of said bit address decoder circuit means in conjunctions with the operation of said word line decoder circuit means effects the selection of at least a predetermined one of said m×n array of memory cells; and,

each of said m bit select circuits including,

first, second, third, fourth, fifth and sixth transistors, said first, second, third and fourth transistors each having an emitter base and collector, said fifth and sixth transistors each having first and second emitters, a base and a collector, said emitter of said first transistor and said base of said third transistor being connected in common, said emitter of said second transistor and said base of said fourth transistor being connected in common,

a first resistor connected between a common connection of said base of said first transistor, said collector of said fifth transistor and said base of said fifth transistor, and a first source of potential,

a second resistor connected between a common connection of said base of said second transistor, said collector of said sixth transistor and said base of said sixth transistor, and said first source of potential,

a third resistor (RBL) connected across the base-emitter junction of said third transistor,

a fourth resistor (RBR) connected across the base-emitter junction of said fourth transistor,

a first Schottky diode connected between the emitter of said third transistor and the collector of said first transistor,

a second Schottky diode connected between the emitter of said fourth transistor and the collector of said second transistor,

said first bit line (BL) of said one of said m pairs of bit lines being connected to said emitter of said third transistor,

said second bit line (BR) of said one of said m pairs of bit lines being connected to said emitter of said fourth transistor,

a common connection between said collectors of said first and second transistors and said bit address decoder circuit means,

a common connection between said second emitters of said fifth and sixth transistors and said switchable bit up level clamp circuit output terminal, and

said first emitters of said fifth and sixth transistors being respectively connected to a WRITE control circuit.

4,598,391

SEISMIC EXPLORATION USING NON-IMPULSIVE VIBRATORY SOURCES ACTIVATED BY STATIONARY, GAUSSIAN CODES, DETECTING VIBRATIONS VIA RECEIVERS WITHIN A WELLBORE AND PROCESSING THE RESULTS INTO DISTORTION-FREE FINAL RECORDS

Francis Muir, Laguna Niguel, Calif., assignor to Chevron Research Company, San Francisco, Calif.

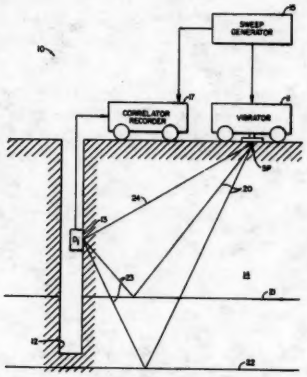
Filed Aug. 23, 1983, Ser. No. 525,587
The portion of the term of this patent subsequent to Aug. 24, 1999, has been disclaimed.
Int. Cl.[4] G01V *1/00*
U.S. Cl. 367—25 **8 Claims**

1. A method of seismic surveying using non-impulsive vibratory sources that recovers all the essential information of full-waveform recording in a distortion-free manner in a wellbore penetrating an earth formation, which comprises:

A. injecting non-impulsive, seismic vibrations into the earth

by activating at least one vibratory source with a driving code of preselected Gaussian, zero-mean, stationary characteristics;

B. recording the seismic vibrations that have propagated through the earth from said at least one vibratory source to at least one receiver within said wellbore; and



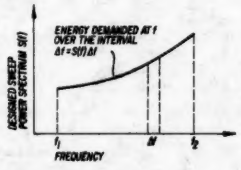
C. cross-correlating a full-waveform preserved representation of said injected vibrations with received seismic vibrations; the result of said cross-correlation being a seismic survey record that is essentially distortion-free.

4,598,392

VIBRATORY SIGNAL SWEEP SEISMIC PROSPECTING METHOD AND APPARATUS

Keh Pann, Richardson, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 26, 1983, Ser. No. 517,200
Int. Cl.[4] G01V *1/14, 1/26, 1/37*
U.S. Cl. 367—32 **25 Claims**



1. A method for seismic surveying using a vibratory signal sweep comprising the steps of:

determining a frequency domain subsurface amplitude attenuation function B(f) for a frequency spectrum existing between frequency components f_1 and f_2 for a subsurface area to be surveyed;

determining a frequency domain noise component function n(f) associated with said area for said frequency spectrum; and

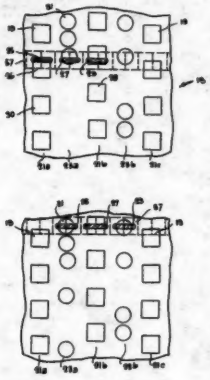
producing a vibratory sweep signal over said frequency spectrum which has a frequency domain power spectrum function S(f) which is a function of said subsurface amplitude attenuation function B(f) and said noise component function n(f).

4,598,393

THREE-BEAM OPTICAL SERVO TRACKING SYSTEM WITH TWO-TRACK PARALLEL READOUT

Gerald A. Pierce, Redwood City; James L. Buxton, East Palo Alto; Norman A. Peppers, Belmont, and Warren J. Vinzant, Menlo Park, all of Calif., assignors to Drexler Technology Corporation, Mountain View, Calif.

Filed Apr. 6, 1984, Ser. No. 597,485
Int. Cl.[4] G11B *7/013, 7/125*
U.S. Cl. 369—46 **14 Claims**



1. A servo tracking system for an optical record comprising,

a pattern of prerecorded marks having optically detectable contrast relative to a field on an optical recording medium, the marks disposed in parallel columns, with each column having spaces between marks, the spacing between columns being sufficient to accommodate data, the marks in each column being aligned in offset positions relative to marks in adjacent columns,

a trio of radiation beams impinging on said medium, disposed in a line perpendicular to said columns, the beams having a spacing such that a center beam impinges on one of said columns and two outside beams impinge on the space between the columns where data is written, said radiation beam being split from a single light beam, the center beam having an intensity which is greater than intensities of said outside beams, the intensity level of said beams being insufficient to make optically detectable changes in said recording medium, and,

means for detecting each of said beams after impingement with said medium.

4,598,394

OPTICAL REPRODUCING APPARATUS WITH FAST ACCESS MODE OPERATION

Chiaki Nonaka, c/o Sony Corporation, 7-35 Kitashinagawa 6-chome, Shinagawa-ku, Tokyo, Japan

Filed Apr. 22, 1983, Ser. No. 487,576
Claims priority, application Japan, Apr. 28, 1982, 57-71674
Int. Cl.[4] G11B *7/00, 17/22;* **H04N** *5/783*
U.S. Cl. 369—44 **9 Claims**

9. An optical reproducing apparatus for read-out of information recorded in substantially parallel tracks on a record medium; said apparatus being selectively operable in one of a standard mode and an access mode and comprising:

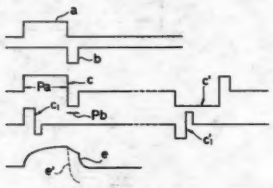
optical pickup means for reproducing said information including light source means emitting a beam of light and tracking servo means operative for controlling the point of the impingement of said beam of light on said record medium in a direction transverse to said track;

jump pulse generator means operative during an access

mode of said apparatus for supplying jump pulses to said tracking servo means by which said tracking servo means effects step-by-step movement of said light beam in said direction across said tracks, each of said jump pulses including at least an accelerating portion;

error correcting means for detecting deviation of said point of impingement of said beam of light from one of said tracks and producing a corresponding error correcting signal which, when supplied to said tracking servo means, removes said deviation;

switch means for selectively supplying, as an input for said



tracking servo means, said jump pulses in said access mode and said error correcting signal in said standard mode:

drive means operative for driving said optical pickup means in said direction transverse to said tracks;

control means supplying a component of said error correcting signal to said drive means for operating the same; and

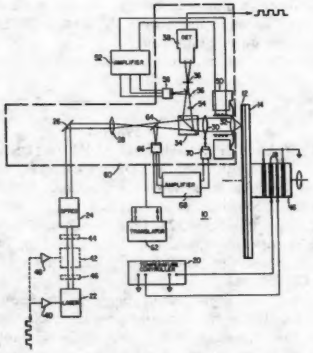
a source of DC voltage supplying said DC voltage to said drive means for driving said optical pickup means in said direction during said access mode, said drive means moving said optical pickup means so that said tracking servo means accurately effects said step-by-step movement in said light beam in said direction.

4,598,395

ERASABLE OPTICAL READ/WRITE DATA STORAGE SYSTEM

James L. Smith, Grand Prairie, Tex., assignor to LTV Aerospace and Defense Co., Dallas, Tex.

Filed May 31, 1983, Ser. No. 499,738
Int. Cl.[4] G01D *15/34;* **G11B** *7/00*
U.S. Cl. 369—100 **30 Claims**



1. An erasable optical read/write data storage system comprising:

a body of temperature sensitive phase change material comprising a planar element coated with a film of thermochromic material adapted to change from a first phase to a second phase at temperatures in excess of a selected upper temperature and from said second phase to said first phase at temperatures less than a selected lower temperature;

a film of optical tuning material disposed on said body;

a temperature controlled support member for maintaining said body of phase change material at a substantially constant temperature above said selected lower temperature and below said selected upper temperature;

means for selectively and temporarily lowering the temperature of said body of phase change material to a temperature below said selected lower temperature wherein said body of phase change material will change to said first phase;

means for temporarily heating selected portions of said body of phase change material to a temperature in excess of said selected upper temperature wherein said selected portions of said body of phase change material will change to said second phase; and

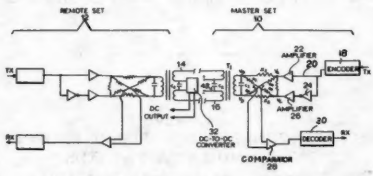
means for optically distinguishing said selected portions of said body of phase change material in said second phase from the remainder of said body of phase change material in said first phase.

4,598,396

DUPLEX TRANSMISSION MECHANISM FOR DIGITAL TELEPHONES

Daniel C. Upp, Southbury, and William G. Bartholomay, Seymour, both of Conn., assignors to ITT Corporation, New York, N.Y.

Filed Apr. 3, 1984, Ser. No. 596,328
Int. Cl.[4] H04B *1/56, 1/52;* **H04J** *15/00;* **H04L** *5/14*
U.S. Cl. 370—27 **4 Claims**



1. A duplex transmission system for exchanging digital signals simultaneously between two locations, comprising:

a first set disposed at one of said two locations;

a second set disposed at the other of said two locations; and

a two-wire loop interconnecting the two sets, each of said sets comprising, a biphase encoder for encoding signals to be transmitted, a biphase decoder for decoding signals that are received, a transformer for transferring transmitted signals to the loop and receiving signals from the loop, an impedance network coupling said transformer, said encoder and said decoder for separating the transmitted and received signals, said biphase encoder and biphase decoder being of the type that produce encoded signals having an average D.C. level of substantially zero, whereby both sets can transmit and receive biphase encoded signals.

4,598,397

MICROTELEPHONE CONTROLLER

Gary A. Nelson, Irvine, and Patrick N. Godding, Tustin, both of Calif., assignors to CXC Corporation, Irvine, Calif.

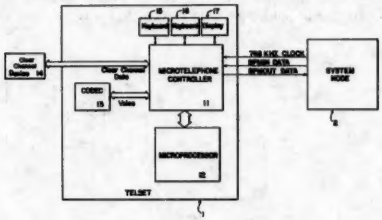
Filed Feb. 21, 1984, Ser. No. 582,069
Int. Cl.[4] H04J *3/12, 3/22*
U.S. Cl. 370—110.1 **22 Claims**

1. A switching device for transferring digital information between a system node which functions at a first rate and one or more devices which function at rates which are different than said first rate, the switching device comprising:

a system interface for communicating a signal stream includ-

ing voice, data, and control information between the switching device and the system node and for providing signals identifying said voice, data, and control information in the switching device, the system interface including a system interface multiplexer operative to combine voice signals from an audio device and data signals from a data device in a message frame for transmission to the system node;

a microprocessor interface responsive to said identifying signals for communicating control information between a selected device and the switching device;



a voice interface responsive to said identifying signals for communicating voice information between an audio device and the switching device;

a data interface responsive to said signals for communicating data information between a data device and the switching device, with said local data device functioning at any of a plurality of rates; and

rate conversion logic for altering the rate of a selected portion of said information to a serial rate which corresponds to a data stream rate of one of said selected, audio, or data devices.

4,598,398

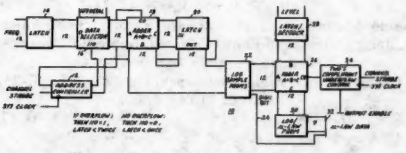
TEST APPARATUS FOR PCM/FDM TRANSMULTIPLEXER

Eric L. Doggett, Raleigh, N.C., assignor to ITT Corporation, New York, N.Y.

Filed Jun. 22, 1984, Ser. No. 623,853

Int. Cl.[4] H04J *1/16, 4/00;* **H04B** *3/46;* **G01R** *31/28*

U.S. Cl. 370—17 **22 Claims**



1. Test apparatus for selectively and programmably testing equipment housing a plurality of channels of transmultiplexer apparatus simultaneously, comprising:

means for generating a sinusoidal waveform;

means for logarithmally representing said waveform and adding a logarithmic attenuation factor thereto for level control,

means for storing digital samples of said representation of said sinusoidal waveform

means for encoding said digital samples into a desired code format and multiplexing with signalling data;

means for programmably and selectively addressing said storage means for causing said stored digital samples to be outputted in a plurality of channels per frame, whereby equipment may be tested with improved frequency resolution and enhanced accuracy.

4,598,399

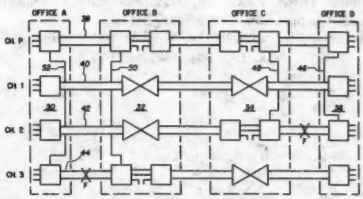
MULTICHANNEL MULTISITE SIGNAL PROTECTION CHANNEL SWITCHING APPARATUS

David E. Bath, Richardson, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 20, 1984, Ser. No. 673,638

Int. Cl.[4] H04J *1/10, 3/08, 1/16, 3/14*

U.S. Cl. 370—55 **5 Claims**



1. An interexchange communication system including a plurality of signal insert and drop sites wherein at least some of the insert and drop sites comprise a mixture of through-repeaters and terminals comprising, in combination:

west signal terminal insert and drop site means having signal termination means for each signal comprising a part of the interexchange communication system;

master switch control module means located at said west signal terminal means for supervising the entire communication system and including an east serial port for receiving slave request and reply messages and sending master commands;

east signal terminal insert and drop site means having signal termination means for each signal comprising a part of the interexchange communication system;

slave switch control module means located at said east signal terminal means including a west serial port for sending slave messages and receiving master commands;

at least one intermediate signal insert and drop site means including a mixture of terminal means and through-repeater means;

slave switch control module means, located at all intermediate signal insert and drop site means including a west serial communications port for sending slave messages from said slave module means, echoing received slave messages from downstream slave modules, and receiving master commands and further including an east serial port for receiving slave messages to be echoed upstream to the master module means, and for echoing received master command messages to downstream slave modules, connected to terminal means at that site for controlling signal paths therethrough;

means at each site for ascertaining failure of a received signal at a terminal at that site whereby a slave message may be sent to said master module means requesting assignment of a protection channel;

a plurality of communication channels extending from said west site means to said east site means wherein some of the channels do not terminate at every site in between but rather have sections containing through-repeaters at some sites;

spare protection signal channel means extending from said west site means to said east site means with intermediate terminal means at each intermediate site requiring spare signal protection; and

means, including communication channel means, for interrogating each said slave control module means at each site by the master module means to ascertain the system configuration of terminals and through repeaters for each signal channel whereby, upon notification of said master module means by the associated slave module means of a failure of a signal channel, the master control module can command two of the control modules to switch in the

shortest possible length of protection channel to bypass the failed section thereby leaving sections of the protection channel to service other failed sections between said west and east terminal site means.

4,598,400

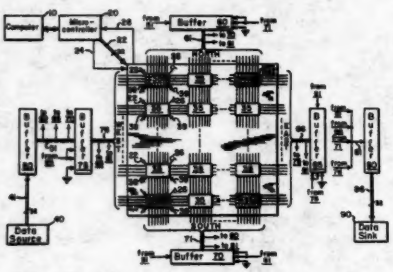
METHOD AND APPARATUS FOR ROUTING MESSAGE PACKETS

W. Daniel Hillis, Brookline, Mass., assignor to Thinking Machines Corporation, Cambridge, Mass.

Division of Ser. No. 499,474, May 31, 1983. This application Nov. 15, 1984, Ser. No. 671,835

Int. Cl.⁴ H04J *3/26*

U.S. Cl. 370—60 **49 Claims**



1. Apparatus for routing message packets through a network of nodes that are interconnected in a pattern of two or more dimensions comprising:

means for generating a message packet that is routed from one node to another in said pattern in accordance with relative address information included in said message packet, said relative address comprising as many digits as there are dimensions, each digit representing the relative displacement of the message packet from the node to which it is addressed,

means associated with each dimension for examining a digit of the address of said message packet received at a node to determine if the displacement in that dimension is zero,

means associated with each dimension for routing said message packet to another node in the same dimension if an examined digit indicates that the message packet has not reached its destination and if a connection to such node is available,

means for passing the message packet from one examining means to another when the message packet is not routed to another node in the same dimension, and

storing and processing means for routing message packets that have reached their destination to a message sink, for temporarily storing message packets that have not been routed on to their destination and for recycling stored message packets to said examining means for further routing.

4,598,401

CIRCUIT TESTING APPARATUS EMPLOYING SIGNATURE ANALYSIS

Michael Whelan, Titusville, N.J., assignor to Siemens Corporate Research & Support, Inc., Iselin, N.J.

Filed Jun. 25, 1984, Ser. No. 606,746

Int. Cl.⁴ G06F *11/00*

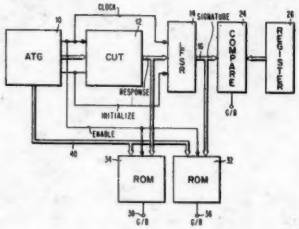
U.S. Cl. 371—25 **5 Claims**

1. Apparatus for testing an electrical circuit having a first input and a first output, said apparatus comprising, in combination:

(a) test control means for applying a test sequence of test signals to said first input of said electrical circuit thereby to evoke, in response to each test signal, a response signal by said electrical circuit at said first output;

(b) linear feedback signature register (LFSR) means, having a second output plus a second input, the second input is connected to said first output of said electrical circuit, the LFSR means producing a state signal at said second output representing the current state of said LFSR means, in dependence upon the prior state of said LFSR means and a received response signal;

(c) programmed, first read-only-memory (ROM) means, having a first data output plus a first address input, the first address input is connected to said second output of said LFSR means, the first ROM means producing a first signal at said first data output upon receipt of said state



signal if said state signal represents a permissible state of said LFSR means within the test sequence of said electrical circuit, and the first ROM means producing a second signal at said first data output upon receipt of said state signal if is said state signal does not represent a permissible state of said LFSR means within the test sequence; and

said first read-only-memory means comprising

(1) a plurality of ROM units, each having third address inputs and a third data output, said third address inputs of all of said ROM units being connected in parallel to said second output of said LFSR meanas; and

(2) enabling means, connected to all of said ROM units, for enabling successive ones of said ROM units in sequence to enable the checking of the state signal at specific points within the test sequence.

4,598,402

SYSTEM FOR TREATMENT OF SINGLE BIT ERROR IN BUFFER STORAGE UNIT

Toshio Matsumoto, and Motokazu Kato, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 7, 1983, Ser. No. 549,462

Claims priority, application Japan, Dec. 25, 1982, 57-231874

Int. Cl.⁴ G06F *11/10*

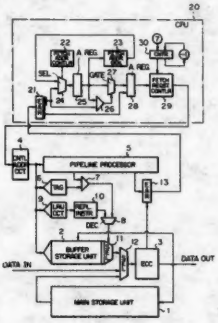
U.S. Cl. 371—38 **11 Claims**

1. A system for treatment of single-bit errors in a buffer storage unit included in a data processing device, said data processing device comprising a main storage unit for storing data in blocks; a buffer storage unit for holding a multiple block portion of the data stored in said main storage unit in memory sectors of the buffer storage using a set-associative scheme; an error check and correct circuit, operatively connected to said main storage unit and said buffer storage unit, for checking and correcting single-bit errors and checking plural bit errors, the data stored in said buffer storage unit passing through said error check and correct circuit during read and write operations, said system for treatment of single-bit errors comprising:

error-data address holding means, operatively connected to said error check and correct circuit, for holding an address for data in said buffer storage unit which is found to contain a single-bit error during a read operation of said buffer storage unit; and

memory address generating means, operatively connected to

said error-data holding means and said buffer storage unit, for generating addresses for blocks in said main storage unit, other than the block containing the single-bit error, corresponding to a predetermined memory sector of said buffer storage unit which holds the data containing the



single-bit error, until the data containing the single-bit error is moved out from the predetermined memory sector of said buffer storage unit, checked and corrected in said error check and correct circuit and stored in said main storage unit.

4,598,403

ENCODING METHOD FOR ERROR CORRECTION

Kentaro Odaka, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

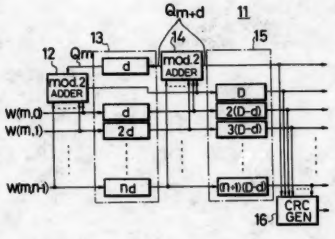
PCT No. PCT/JP82/00125, § 371 Date Dec. 2, 1982, § 102(e) Date Dec. 2, 1982, PCT Pub. No. WO82/03719, PCT Pub. Date Oct. 28, 1982

Continuation of Ser. No. 451,157, Dec. 2, 1982, abandoned. This PCT application Apr. 16, 1982, Ser. No. 731,339

Claims priority, application Japan, Apr. 16, 1981, 56-57630; Feb. 23, 1982, 57-45859

Int. Cl.[4] G06F *11/10*

U.S. Cl. 371—39 **10 Claims**



1. An encoding method for error correction comprising the steps of:

arranging consecutive PCM data into a block having (m×n) word units;

selecting a first error correction redundant code from control signals to form an initial first error correcting code;

interleaving said data and said initial first error correction code to form a first interleaved block;

generating a second different error correction redundant code from said first interleaved block and including each word in said block;

feeding back said second error correction redundant code and generating a subsequent first error correction redundant code using said block and said second error correction redundant code in which said subsequent first error correction redundant code includes each word of said second error correction redundant code;

interleaving said first interleaved block and said first error correction redundant code to form a second interleaved block; and

transmitting said second interleaved block and said second error correction redundant code.

4,598,404

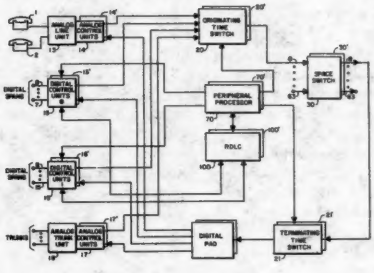
DATA FORMAT ARRANGEMENT FOR COMMUNICATION BETWEEN THE PERIPHERAL PROCESSORS OF A TELECOMMUNICATIONS SWITCHING NETWORK

Thomas J. Perry, Phoenix, and Muhammad I. Khera, Glendale, both of Ariz., assignors to GTE Automatic Electric Inc., Northlake, Ill.

Filed Dec. 22, 1983, Ser. No. 564,137

Int. Cl.[4] G06F *11/00*

U.S. Cl. 371—49 **13 Claims**



1. A data message formatter for conveying control information from a peripheral processor of one telecommunication switching system to a peripheral processor of at least one other telecommunication switching system, each telecommunication switching system connected to the other by a digital data link and each including a digital link controller connected between said peripheral processor and said digital data link, each data link controller arranged to receive from its associated peripheral processor said control information, where said control information is formatted into said data message and transmitted over said data link to the data link controller of another peripheral processor, said data message format comprising:

at least one control word having eight information bits said control word including a control field having six control bits, said control word further including a data bit and a control word parity bit, said control word arranged to convey to a receiving data link controller data link status information;

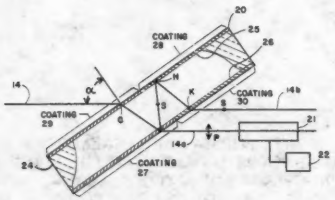
a plurality of data words, each data word is comprised of seven data bits, and a data word parity bit, and said plurality of data words contain 63 data bits in nine data words, said data words arranged to pass instructions and status information to a receiving peripheral processor; and

a parity word including a plurality of parity bits, each parity bit providing parity for an associated plurality of said preceding plurality of data words and control words, said parity word further including a parity word parity bit.

4,598,405
LASER APPARATUS WITH ELECTRO-OPTIC Q-SWITCH ASSEMBLY

Edward D. Reed, Jr., and George J. Benedict, both of Sunnyvale, Calif., assignors to GTE Communication Products Corporation, Stamford, Conn.

Filed Dec. 27, 1983, Ser. No. 565,567
Int. Cl.[4] H01S 3/115
U.S. Cl. 372—12 4 Claims



1. In a laser apparatus with a lasing medium having an optical axis, means to energize said medium for producing an unpolarized laser beam along said optical axis, a first partially optically transmissive reflecting element traversing said axis spaced from one end of said medium, and a second totally reflecting element traversing said axis and spaced from the opposite end of said medium, the improvement of a Q-switch assembly traversing said axis between said medium and said second element comprising:

a polarizing beam splitter adjacent to said other end of the lasing medium and a Q-switch between said splitter and said second element;

said splitter comprising a transparent optical glass block having first and second plane parallel external surfaces, said first surface being proximate to said lasing medium and being inclined at an angle less than 90° relative to said laser beam whereby to refract said unpolarized beam propagating from said medium to a first point of intersection with said second surface, a dielectric polarizing coating on said second surface at said first point of intersection, said coating constituting means for dividing said unpolarized laser beam into first and second sub-beams, said first sub-beam having a first polarization and propagating through said coating in a first direction, said second sub-beam having a second polarization orthogonal to said first polarization and being reflected by said coating to a second point of intersection with said first surface of said block, said first surface having a highly reflective coating at said second point of intersection, said second sub-beam being reflected from said second point to a third point of intersection with said second surface separated from said first point of intersection, said second sub-beam being refracted at said third point of intersection on said second surface whereby to propagate therefrom in a second direction parallel to said first direction;

said second reflecting element intersecting said first and second parallel sub-beams and redirecting each sub-beam back toward said second surface along the path of the other sub-beam;

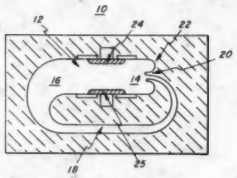
a Q-switch between said second block surface and said second element in the path of only one of said sub-beams; and

means to energize said Q-switch whereby to change the polarization of each of said sub-beams by 90° and cause them to recombine at said block for propagation along said optical axis through said lasing medium and said first element as the output from said laser apparatus.

4,598,406
PRESSURE-WAVE CYCLED, REPETITIVELY PULSED GAS LASER

Jeffrey J. Fino, Melville, N.Y., and George E. Faulkner, Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 18, 1985, Ser. No. 692,453
Int. Cl.[4] H01S 3/22
U.S. Cl. 372—59 9 Claims

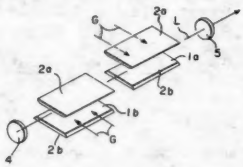


1. A gas laser comprising a laser cavity, a lasing discharge gas in the laser cavity, lasing initiation means for producing a shock wave and an inherent pressure pulse resulting from said shock wave, and pneumatic circulating means using the shock wave and the inherent pressure pulse to circulate the lasing gas through the laser between discharge pulses such that removal of disassociated or ionized or both species of gas from the discharge region is achieved prior to the next discharge of the laser.

4,598,407
ORTHOGONAL TYPE GAS LASER OSCILLATOR

Eikichi Hayashi, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 19, 1984, Ser. No. 632,463
Claims priority, application Japan, Jul. 27, 1983, 58-137157
Int. Cl.[4] H01S 3/097
U.S. Cl. 372—87 17 Claims



1. An orthogonal type gas laser oscillator, which includes:

(a) an even number of independent pairs of opposing electrodes, disposed along the optical axis of said oscillator;

(b) a laser medium gas which flows in a predetermined direction transverse to said optical axis through one half of said even number of electrode pairs, and flows through the remaining one half of said electrode pairs in a direction opposite to said transverse direction;

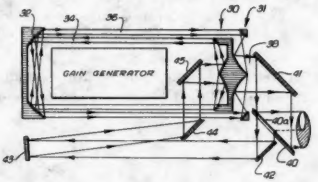
(c) wherein the deflections of the optical axis of the electrode pairs due to the movement of the laser medium gas offset each other.

4,598,408

HIGH EXTRACTION EFFICIENCY CYLINDRICAL RING RESONATOR

John D. O'Keefe, Manhattan Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Oct. 22, 1984, Ser. No. 663,294
Int. Cl.[4] H01S *3/083*
U.S. Cl. 372—94 **10 Claims**



1. An annular ring resonator for a high-energy laser, having high extraction efficiency, and comprising:

a conical rear mirror;

a scraper mmirror;

a first axicon positioned to receive a generally cylindrical beam from the scraper mirror, and to produce an expanded annular beam to pass through an annular gain region to the conical rear mirror;

a second axicon, in opposing position to the first axicon, for receiving an annular beam reflected from the conical rear mirror, and producing a generally cylindrical compacted beam for transmission to the scraper mirror, wherein the scraper mirror has an aperture to pass a return beam for transmission to the first axicon; and

optical means for transmitting the compacted beam from the second axicon to the scraper mirror and from the scraper mirror to the first axicon;

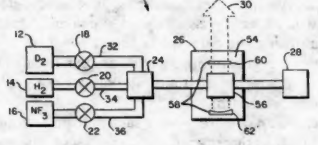
whereby the annular beam makes two passes through the gain region, and the combination of two types of axicons and the conical mirror has substantially no net effect on polarization.

4,598,409

CW HF R-BRANCH LASER

Hagop Injeyan, Los Angeles, and John H. S. Wang, Rancho Palos Verdes, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 23, 1984, Ser. No. 583,026
Int. Cl.[4] H01S *3/095*
U.S. Cl. 372—89 **3 Claims**



1. A chemical laser for continuous wave (CW) HF R-branch line operation, said laser outputting a CW laser beam having a wavelength of about 2 to 2.5 micrometers for use in an atmosphere progation window, said laser comprising:

means for providing fuels and oxidizers, a first fuel being deuterium, a second fuel being hydrogen and an oxidizer being nitrogen trifluoride;

means for controlling the flow of said fuels and said oxidizer from said means for providing;

a mixing chamber, said mixing chamber including a linear array nozzle system, a plurality of first reaction chambers, and a second reaction chamber, said fuel deuterium and said oxidizer nitrogen trifluoride are input by said controlling means into each of said first reaction chambers wherein a first set of reaction products are formed, said first set of reaction products being output by a plurality of primary nozzles into said secondary reaction chamber, said fuel hydrogen being input by said controlling means and being output by a plurality of secondary nozzles to said secondary reaction chamber, said hydrogen and said first set of reaction products reacting in said secondary chamber to form a second set of reaction products having therein excited HF almost totally inverted between upper and lower states to achieve a laser gain threshold;

an extraction chamber, said extraction chamber including a laser resonator, said extraction chamber receiving said second set of reaction products and outputting a continuous R-branch line laser beam, said resonator having a pair of discriminating resonator mirrors therein, said resonator mirrors having a reflectance centered on R-branch line wavelengths, said reflectance being appropriately 95% at 2.5 micrometers and rapidly decreasing to 75% at 2.6 micrometers, said resonator outputting a continuous wave R-branch line ($v=1\rightarrow0$, $J=2\rightarrow1$) laser beam at 2.47 micrometers; and

a reaction product neutralizes said neutralizer receiving said products from said extraction chamber.

4,598,410

BIDIRECTIONAL REPEATER APPARATUS

Walter A. Smith, Kettering; James R. Small, Englewood, and Ronald D. Ward, Jr., Trotwood, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Sep. 17, 1984, Ser. No. 651,502
Int. Cl.[4] H04B *3/36*
U.S. Cl. 375—3 **14 Claims**

1. A bidirectional repeater apparatus connected between a pair of processing units by first and second communication lines for transmitting and receiving data signals transmitted between the processing units over both of said lines comprising:

first transceiver means for transmitting first data signals over said second communication line received from said first communication line when enabled;

second transceiver means for transmitting second data signals over said first communication line and received from said second communication line when enabled;

logic circuit means connected to said first and second transceiver means for generating a first actuating signal in response to receiving said first data signals and a second actuating signal in response to receiving said second data signals;

outputting means connected to said first and second transceiver means and said logic circuit means for outputting a first enabling signal to said first transceiver means in response to said second transceiver means receiving said first data signals over said first communication line enabling said first transceiver means to transmit the first data signals over the second communication line;

and said first transceiver means outputting a feedback signal to said logic circuit means in response to the first transceiver means transmitting the first data signals over said second communication line, said feedback signal enabling said logic circuit means to condition said outputting means to output a second enabling signal to said second transceiver means in response to said first transceiver means

receiving said second data signal over the second communication line.

4,598,411

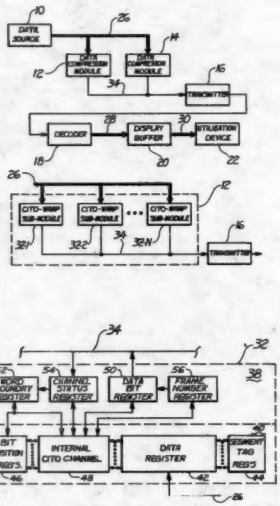
ON-THE-FLY DATA COMPRESSION SYSTEM

Semyon Berkovich, Rockville, Md.; Colleen R. Wilson, Campbellville, Canada, and Chris J. Walter, Columbia, Md., assignors to Allied Corporation, Morristown, N.J.

Filed Jul. 17, 1984, Ser. No. 631,660

Int. Cl.[4] H04B *14/06*; H03M *7/50*

U.S. Cl. 375—27 **20 Claims**



1. A data compression system having a communication channel interposed between a data source and an ultimate utilization device characterized by;

at least one data compression module for transmitting on the communication channel the data received from the data source in a compressed format comprising an interleaved transmission of data bits and bit position bits, said bit position bits indicative of the number of data bits to be transmitted in the subsequent data bit transmission which are different from the preceding data bit transmission; and

data decoder means responsive to the data bits and bit position bits transmitted on the communication channel for reconstructing the data to its original format as generated by the data source; and

wherein said at least one data compression module comprises a plurality of sub-modules, each sub-module comprising:

data storage means for temporarily storing the data received from the data source in a plurality of data registers, each data register storing a predetermined segment of the received data;

a plurality of bit position registers, one associated with each data register, for storing bit position bits indicative of the number of data bits in its associated data register remaining to be transmitted;

a word boundary register connected to the communication channel for storing a number corresponding to the smallest number of data bits in any data register in any sub-module remaining to be transmitted;

means for repeatedly selecting data bits to be transmitted from said plurality of data registers;

means for transmitting said selected data bits on said communication channel one at a time simultaneously with the transmission of a selected data bit by the other sub-modules using a content induced transmission overlap protocol until all of the bits from at least one data register in any sub-module is completely transmitted;

bit competition means responsive to each time all the data bits from any data register in any sub-module are completely transmitted for transmitting said bit position bits on said communication channel simultaneously with the other sub-modules using a content induced transmission overlap protocol to generate a number corresponding to the smallest number of data bits remaining in any data register in any sub-module; and

means for recording said number corresponding to the smallest number of data bits in said word boundary register.

4,598,412

BINARY DIGITAL DATA SIGNAL REPRODUCING CIRCUIT IN DIGITAL DATA TRANSMISSION SYSTEM

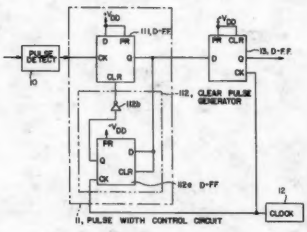
Tadahiro Yoshida, Kawasaki, Japan, assignor to Nitsuko Limited, Kawasaki, Japan

Filed Feb. 11, 1985, Ser. No. 700,082

Claims priority, application Japan, Feb. 9, 1984, 59-20766

Int. Cl.[4] H04L *25/08*

U.S. Cl. 375—94 **6 Claims**



1. A circuit for reproducing a binary digital data signal with a predetermined bit length from a signal received at a receiver side in a data transmission system for transmitting said binary digital data signal from a transmitter side to said receiver side through a digital transmission line, which comprises:

pulse detecting circuit means for comparing said received signal with a reference signal level and detecting pulse signals on said received signal to provide a first pulse train comprising the detected pulses;

clock pulse generating means for generating clock pulses having a repetition time interval equal to said predetermined bit length;

first circuit means receiving said first pulse train from said pulse detecting means and said clock pulses from said clock pulse generating means and generating a second pulse train corresponding to said first pulse train, each one pulse of said second pulse train having a pulse width which is determined by a time duration from an application of a corresponding one pulse of said first pulse train to an application of one clock pulse from said clock pulse generating means after that;

second circuit means for sampling said second pulse train by said clock pulses from said clock pulse generating means, to thereby provide the reproduced digital data signal therefrom.

4,598,413

CIRCUIT ARRANGEMENT FOR FRAME AND PHASE SYNCHRONIZATION OF A LOCAL SAMPLING CLOCK

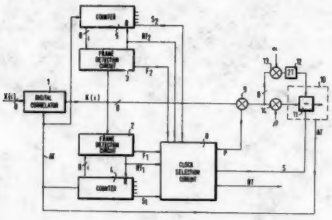
Kalman Szöchènyi, Spiegelberg, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Sep. 12, 1984, Ser. No. 649,866

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1983, 3333714

Int. Cl.[4] H04L *7/08*

U.S. Cl. 375—116 **10 Claims**



1. An arrangement for synchronizing a local sampling clock to frame position and phase of the characters of a received character stream containing a unique word at regular time intervals, said arrangement including a digital correlator which generates a crosscorrelation function from the received character stream, sampled at a sampling clock rate, and a unique word stored in said correlator and comprising a first frame detection circuit which derives a first frame clock from those maxima of the crosscorrelation function recurring at intervals of one frame period, and a second frame detection circuit (3) which derives a second frame clock from those minima of the crosscorrelation function recurring at intervals of one frame period, the time of a first occurrence of a maximum or a minimum having a time index io, and further comprising a clock selection circuit (8) connected to said frame detection circuits which determines which of the two frame clocks is being received within a limited time interval, and comprising also a phase synchronization circuit (10) connected to said clock selection circuit, said phase synchronization circuit receiving control information related to the selected frame clock for providing phase information (ΔP) for control of the sampling clock (AT), said phase synchronization circuit also being coupled to said digital correlator whereby values of said crosscorrelation function are fed thereto and wherein the phase information (ΔP) is provided as a function of values $K(i_0+1)$, $K(i_0-1)$ which the crosscorrelation function has in the vicinity of the maximum or minimum.

4,598,414

INPUT COMPRESSION APPARATUS FOR CHARGE COUPLED DEVICES

Michael F. Dries, Chanhassen, Minn., and Mark N. Gurnee, Framingham, Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 332,061, Dec. 18, 1981, abandoned. This application Oct. 26, 1984, Ser. No. 665,089

Int. Cl.[4] G11C *19/28;* H01L *29/78*

U.S. Cl. 377—58 **13 Claims**

1. Apparatus for compressing an input signal so as to accommodate a large dynamic range of said signal without loss of information represented by said signal, said apparatus comprising:

A. first storage means for receiving said input signal;

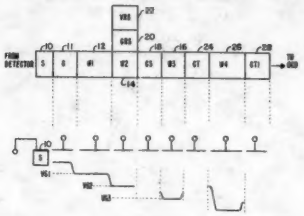
B. second storage means for receiving all or a portion of said signal from said first storage means;

C. third storage means for receiving all or a portion of said signal from said second storage means;

D. first gate means coupled between said second and third storage means so as to selectively inhibit the transfer of all or a portion of said signal from said second storage means to said third storage means;

E. means for coupling said third storage means for transfer of all or a portion of said signal to a receiving device;

F. wherein each of said first, second and third storage means is coupled to store said signal or portion thereof depending upon the storage potential thereof, and wherein the storage potential of said first storage means is less than the storage potential of said second storage means; and



G. an accumulator storage means for successively accumulating a predetermined number of portions of said input signal transferred from said third storage means prior to receipt thereof by said receiving device.

4,598,415

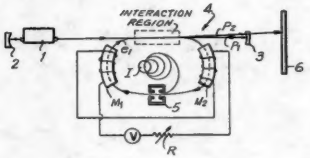
METHOD AND APPARATUS FOR PRODUCING X-RAYS

Alfredo U. Luccio, and Bertrand A. Brill, both of Shoreham, N.Y., assignors to Imaging Sciences Associates Limited Partnership, Great Neck, N.Y.

Continuation-in-part of Ser. No. 415,015, Sep. 7, 1982, abandoned. This application Aug. 15, 1983, Ser. No. 522,567

Int. Cl.[4] G21G *4/00;* G21K *1/00;* H01J *35/00;* H05G *1/00*

U.S. Cl. 378—119 **43 Claims**



1. A method of irradiating an object with X-rays in a desired range suitable for medical diagnostic and therapeutic, or industrial testing, purposes, comprising the steps of:

(a) passing a multitude of incoming electrons at a predetermined energy level in one direction along a predetermined path through an interaction region;

(b) directing a multitude of incoming photons at a predetermined energy level along a direction opposite to the one direction through the interaction region and into colliding relationship with the incoming electrons, whereby outgoing photons are propagated at an increased energy level by the Compton scattering effect substantially along the one direction towards the object to be X-rayed;

(c) controlling the energy level of the incoming electrons to convert the outgoing photons to X-rays within the desired range;

(d) guiding the X-rays towards the object to be irradiated; and

(e) said directing step including the step of generating the incoming photons from a light source, and directing them in said one direction, and reflecting the incoming photons for propagation back along the same path in said opposite direction while the electrons are passed in the one direc-

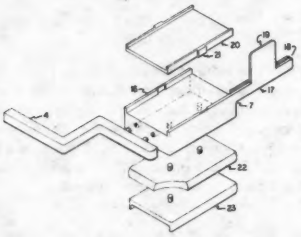
tion, said reflecting taking place between the object and the interaction region, such that said X-rays may be directed at a surface of the object confronting the interaction region without restriction from the object.

4,598,416

FILM HOLDER AND BITE BLOCK DEVICE FOR RADIOGRAPHING TEETH DURING ENDODONTIC TREATMENT

Dominic A. Donato, 1340 Summit La., Mountainside, N.J. 07092

Filed Aug. 13, 1984, Ser. No. 639,744
Int. Cl.[4] A61B *6/14*; G03B *42/04*
U.S. Cl. 378—168 **4 Claims**



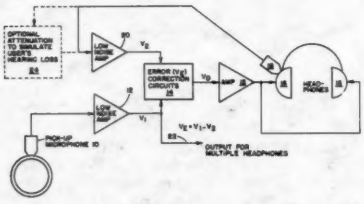
1. A bite block-film holder complex in which the bite block is laterally affixed as viewed from the x-ray source to the film holder portion to allow instruments, e.g. endodontic files, to protrude from the object tooth in an unobstructed manner.

4,598,417

ELECTRONIC STETHOSCOPE

Norman S. Deno, State College, Pa., assignor to Research Corporation, N.Y.

Filed Aug. 15, 1984, Ser. No. 641,130
Int. Cl.[4] A61B *7/04*; H03F *21/00*; H04R *3/04, 19/01*
U.S. Cl. 381—67 **10 Claims**



1. An electronic stethoscope, comprising:

a. a pickup microphone for detecting audible sounds from a patient and for producing an output signal representative thereof;

b. a control circuit including a variable gain amplifier means coupled to the output signal of said pickup microphone for amplifying the signal, said variable gain amplifier means having a dynamically controllable transfer function;

c. at least one acoustic transducer coupled to said amplifier for converting the amplified signal to audible sounds for audible detection by a person utilizing the electronic stethoscope;

d. a feedback microphone for detecting the audible sound produced by said acoustic transducer and for providing a feedback output signal representative thereof; and

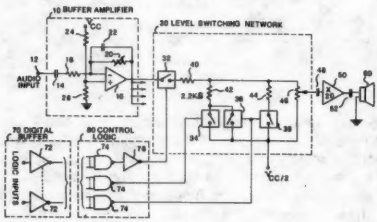
e. said control circuit comparing said feedback output signal with the output signal produced by said pickup microphone to dynamically control the transfer function of said variable gain amplifier, such that the audible output of the acoustic transducer is substantially the same as the audible input to the pickup microphone.

4,598,418

SOUND SYSTEM EMPLOYING AUTOMATIC PROPORTIONAL AMPLIFICATION

Eugene R. Griffith, Jr., 1 Berthe Cir., Colorado Springs, Colo. 80906, and Steven T. Connett, 1717 Van Diest Rd., Colorado Springs, Colo. 80915

Continuation of Ser. No. 699,213, Feb. 5, 1985, abandoned, which is a continuation of Ser. No. 457,419, Jan. 12, 1983, abandoned. This application Oct. 15, 1985, Ser. No. 788,092
Int. Cl.[4] H04R *27/00*
U.S. Cl. 381—83 **4 Claims**



1. A multichannel sound system for providing voice pickup and distribution in a common area, the system comprising:

a plurality of audio signal sources, an active one of which provides an audio input signal;

a plurality of loudspeakers for distributing sound represented by said audio input signal in the same general area as that in which said plurality of audio signal sources is located, at least one of said plurality of loudspeakers being separately associated with and located in close proximity to each one of said plurality of audio signal sources;

a plurality of line amplification means, each of which is coupled to one or more of said plurality of loudspeakers and adapted to receive said audio input signal;

a plurality of level switching networks, each of which is coupled between said plurality of audio signal sources and one of said plurality of line amplification means for selectively attenuating the audio input signal before it is applied to said plurality of line amplification means;

logic source means for supplying a logic input signal indicative of which of said plurality of audio input signal sources is active; and

a plurality of control logic means, each of which is coupled to receive said logic input signal and is further coupled to an associated one of said plurality of level switching networks for selectively controlling the level of attenuation of said audio input signal by that level switching network.

4,598,419

AUTOMATIC DEVICE FOR THE STATISTICAL ANALYSIS OF AN OBJECT

Jacques Mignot, and Patrice Pouyet, both of Paris, France, assignors to Societe d'Optique, Precision Electronique et Mechanique (SOPELEM), Levallois-Perret, France

Filed Sep. 15, 1982, Ser. No. 418,359
Claims priority, application France, Sep. 25, 1981, 81 18077
Int. Cl.[4] G06K *9/00*
U.S. Cl. 382—6 **7 Claims**

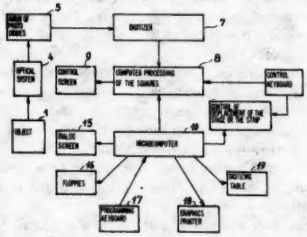
1. Automatic system for statistical analysis of an object (1), comprising

(a) optical means (4) for projecting on a photoelectric re-

ceiver (5) images of elementary parts (12) of said object (1), said images themselves consisting of a predetermined number of elementary parts (12), with means of continuous, constant-speed, relative movement between said object (1) and said receiver (5), so that said images of said elementary parts (12) of said object (1) are projected continuously on said photoelectric receiver (5);

(b) electronic means (7) for continuously digitizing each of said images (12), said image having a plurality of elementary points each of which is coded as a bit;

(c) a computer (8) for continuously storing said images (12), a number of images (12) equal to the number of elementary points of each image (12) forming a set image (11)



called a square, and for successive processing of each square (11) consisting in dividing said square (11) into smaller and smaller equal squares the number of which increases, at each division, until a number of squares equal to the number of elementary points in the initial square (11) is obtained, and, at each division, in calculating the percentage of squares containing at least one point equal to 1 relative to the total number of squares, these percentages constituting the parameters for characterizing said square (11); and

(d) electronic means (10) for continuously storing said parameters in a memory followed by statistical calculations by means of the set of parameters stored in memory for an average characterization of the object (1) under study.

4,598,420

OPTICAL GRID ANALYZER SYSTEM FOR AUTOMATICALLY DETERMINING STRAIN IN DEFORMED SHEET METAL

Dennis N. Harvey, Chaska, Minn., assignor to MTS Systems Corporation, Minneapolis, Minn.

Filed Dec. 8, 1983, Ser. No. 559,406
Int. Cl.⁴ G06K *9/00*
U.S. Cl. 382—8 **22 Claims**

1. A system for automatically determining strain in sheet metal by a forming operation, the sheet metal having a grid of open circles thereon, the open circles having a predetermined circle size parameter prior to the forming operation and wherein the open circles are stretched into patterns of generally elliptical shape as a result of the forming operation, the system comprising:

means for producing signals representative of light intensity of pixels of an image of a portion of the sheet metal in which including one of the patterns;

means for converting each of the signals to a binary value representative of whether the light intensity exceeds a threshold to produce a binary image;

means for producing transition point data representing coordinates of pixels of the binary image which are located on an image edge;

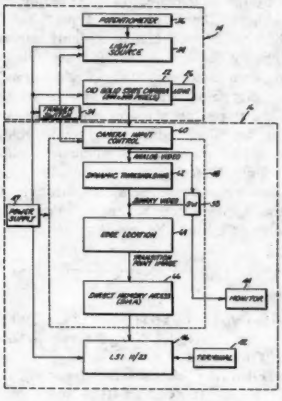
means for deriving an outer edge of the pattern from the transition point data;

means for deriving an inner edge of the pattern from the transition point data;

means for deriving first ellipse parameters of the outer edge;

means for deriving second ellipse parameters of the inner edge;

means for deriving average ellipse parameters of the pattern based upon the first and second ellipse parameter; and



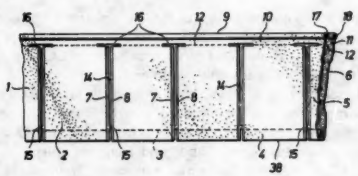
means for calculating strain values based upon the ellipse parameters and the predetermined circle size parameter of the undeformed circle.

4,598,421

BELT HAVING A SUCCESSION OF PACKAGING BLANKS

Jan Jostler, Halmstad, Sweden, assignor to Jiker System Aktiebolag, Sweden

Continuation of Ser. No. 354,082, filed as PCT SE 81/00187 on Jun. 25, 1981, Published as WO 82/00129 on Jan. 21, 1982, now Pat. No. 4,558,556. This application Jun. 10, 1985, Ser. No. 742,926
Claims priority, application Sweden, Jun. 30, 1980, 8004829
Int. Cl.⁴ B65D *33/14*
U.S. Cl. 383—37 **11 Claims**



1. A continuous, flexible belt of packaging blanks movable on a guiding means from an initial holding station past a filling station to a closing station, said belt comprising two opposing walls having longitudinal first and second edges and including a number of consecutively arranged packaging blanks each having a bottom section at said first edge and two bonding zones arranged transversely in relation to the longitudinal direction of the belt, which zones form side closures of the packaging blanks, said belt further comprising two strip sections arranged substantially opposite one another in the opposing walls and extending in the longitudinal direction of the belt at said second edge, each strip section including a continuous holding means for support of the strip and slidable engagement with a guiding means which serves for opening the packaging blanks at a filling station for filling the packaging blanks as said blanks travel longitudinally by travel to said holding means on the guiding means, said belt being provided with transverse

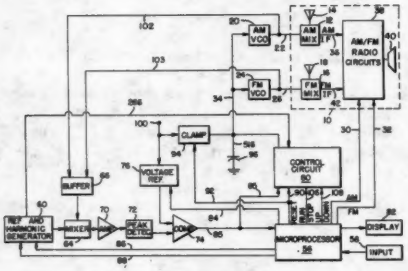
slots spaced longitudinally apart in both of said walls, each transverse slot being arranged between said bonding zones of two adjacent packaging blanks and means in each wall extending on both sides of a respective transverse slot between the packaging blanks and holding means for allowing the blanks to be opened by the engagement of the holding means and the guiding means as the blanks travel past the filling station whereat the now opened blanks, slidably supported at their second edges by the holding means, are filled, the guiding means being contoured with diverging portions at the filling station such that said means in each wall which extends on both sides of a respective transverse slot enables the blanks to be opened at said filling station solely by the guiding means on which the holding means of the blanks are slidably fed, the entire first longitudinal edges of the blank being constructed to be constrained by said guiding means throughout the path of travel of the blanks from the initial holding thereof at the holding station through the closing thereof at said closing station.

4,598,422

HARMONIC TUNING SYSTEM FOR RADIO RECEIVERS

Daniel J. Fellman, Liverpool, N.Y., assignor to General Electric Company, Portsmouth, Va.

Filed Aug. 24, 1984, Ser. No. 644,107
Int. Cl.[4] H04B *1/26*
U.S. Cl. 455—180 **15 Claims**



1. In a radio receiver having radio circuitry of the superheterodyne type, harmonic tuning means comprising:

(a) a voltage controlled local oscillator (VCO) coupled to the mixer of the radio receiver for supplying an output signal thereto at a variable frequency within a range of output frequencies required by the radio circuitry for tuning to a plurality of radio frequency channels within a particular broadcast band, said range of output frequencies being offset from the range of frequencies of the broadcast band by a fixed intermediate frequency,

(b) voltage supply means coupled to said VCO for supplying voltage thereto within a voltage range which will cause said VCO to generate said output signal within said range of output frequencies,

(c) reference and harmonic signal generating means for selectively generating either first and second reference signals at first and second fixed frequencies, respectively, corresponding to the broadcast band and a plurality of harmonic signals at frequencies that are multiples of the selected reference signal,

(d) control signal generating means coupled to both said VCO for receiving therefrom said output signal and said reference and harmonic signal generating means for receiving therefrom said harmonic signals, said control signal generating means generating a control signal whenever the frequency of said VCO output signal differs from one of said harmonic signals by substantially a predetermined frequency, said predetermined frequency being greater than the maximum frequency difference between adjacent ones of said harmonic signals,

(e) said intermediate frequency, said first and second reference signals, and said predetermined frequency at which a control signal is generated being preselected such that:

(i) a first control signal is generated when the first reference signal is being generated and the radio receiver is tuned to a particular radio frequency channel within a central portion of the broadcast band, and

(ii) a second control signal is generated when the second reference signal is being generated and the radio receiver is tuned to any one of a plurality of unique radio frequencies including at least every radio frequency channel within the broadcast band, the frequency difference between adjacent ones of said harmonic signals of said second reference signal being twice the frequency difference between adjacent ones said unique radio frequencies,

(f) control means coupled to said reference and harmonic signal generating means, said voltage supply means, and said control signal generating means, and

(g) input means coupled to said control means for establishing desired radio frequency channels,

(h) said control means being responsive to a desired radio frequency channel established by said input means to sequentially:

(i) cause said reference and harmonic signal generating means to generate initially said first reference signal,

(ii) cause said voltage supply means to supply voltage to said VCO initially at a substantially known voltage and thereafter vary the supply voltage in a predetermined direction to change the frequency of the VCO output signal within a central portion of the range of frequencies corresponding to the broadcast band,

(iii) upon receipt of the first control signal from said control signal generating means, (1) utilize the first control signal as a marker representing actual tuning to said particular radio frequency within a central portion of the broadcast band, (2) cause said reference and harmonic signal generating means to generate said second reference signal, and (3) cause said voltage supply means to vary the supply voltage to said VCO in a direction to change the output frequency of said VCO output signal toward the frequency corresponding to the desired radio frequency channel,

(iv) utilize each subsequent control signal as a marker representing actual tuning to a respective unique radio frequency within the broadcast band, and

(v) prevent in the absence of a subsequent desired radio frequency channel further substantial change of the supply voltage to said VCO upon receipt of the control signal corresponding to the desired radio frequency channel.

4,598,423

TUNING CIRCUIT FOR A MULTIBAND TUNER

James Hettiger, Marion County, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 28, 1985, Ser. No. 705,500
Int. Cl.[4] H04B *1/16*; H03J *5/00*
U.S. Cl. 455—191 **7 Claims**

1. In a tuner, apparatus comprising:

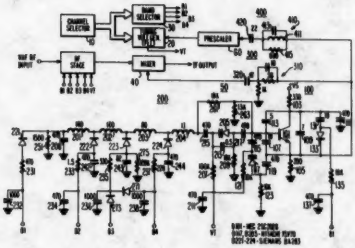
a variable capacitance element;

first, second and third inductors coupled in series in the order named between said variable capacitance element and a point of reference potential;

first switch means for selectively coupling a first point between said first and second inductors to said point of reference potential in response to a first bandswitching signal thereby coupling said first inductor and said variable capacitance element in a first tuned circuit configuration corresponding to first frequency band;

second switch means for selectively coupling a second point

between said second and third inductors to said point of reference potential in response to a second bandswitching signal thereby coupling said first and second inductors and said variable capacitance element in a second tuned circuit configuration corresponding to a second frequency band lower in frequency than said first frequency band;



control means for generating said first and second bandswitching signals independently of one another one at a time; and

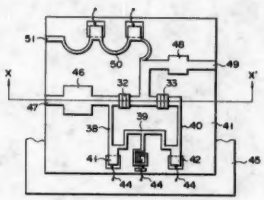
auxiliary switch means for selectively coupling said second point between said second and third inductors to said point of reference potential in response to said first bandswitching signal without affecting said second bandswitching signal.

4,598,424

MICROWAVE MIXER CIRCUIT

Shigeru Watanabe, Tokyo; Naotaka Tomita, Kawasaki, and Shigekazu Hori, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 18, 1984, Ser. No. 601,573
Claims priority, application Japan, Apr. 22, 1983, 58-70975
Int. Cl.[4] H04B *1/26*
U.S. Cl. 455—327 **5 Claims**



1. A microwave mixer circuit comprising:

a semi-insulating semiconductor substrate;

two diodes formed on said semiconductor substrate and connected in series with a node being formed therebetween;

a phase inverting circuit including:

(a) a plurality of series connected inductive elements connected to one another at nodes therebetween, thereby forming a string of inductive elements with no non-inductive elements separating any inductive elements, said string connected in parallel across said two series connected diodes, and

(b) at least one capacitive element connected to a node between any two of said inductive elements, for inverting the phase of an input signal;

a first high frequency signal input terminal coupled to one of said diodes and to one end of said phase inverting circuit;

a second high frequency input terminal connected to the node between said two diodes;

a low-pass filter element having an input terminal and an output terminal, said input terminal being connected to one of said first and second high frequency signal input terminals; and

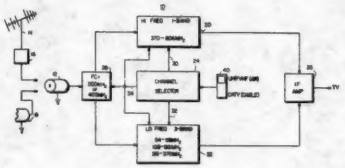
an intermediate frequency output terminal directly connected to said output terminal of said low-pass filter element.

4,598,425

ALL-CHANNEL TELEVISION TUNING SYSTEM

Peter C. Skerlos, and Peter Strammello, Jr., both of Arlington Heights, Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Feb. 9, 1984, Ser. No. 578,462
Int. Cl.[4] H04B *1/16*; H03J *5/24*
U.S. Cl. 455—180 **9 Claims**



1. An all-channel television tuner comprising:

a high frequency section tunable over a first range of frequencies without bandswitching in said high frequency section;

a low frequency section tunable over a second range of frequencies with bandswitching in said low frequency section, said high frequency and said low frequency sections together spanning a continuum of television cable and air channel frequencies covering all VHF, CATV and UHF channels;

a common input terminal in said tuner for receiving said continuum of frequencies; and

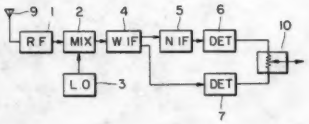
signal diverting means for directing incoming signals from said common input terminal to appropriate ones of said sections.

4,598,426

VARIABLE INTERMEDIATE BANDWIDTH AM RECEIVER

Kazuo Shiojima, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Japan

Filed Apr. 4, 1984, Ser. No. 596,719
Claims priority, application Japan, Apr. 6, 1983, 58-59375
Int. Cl.[4] H04B *1/16*
U.S. Cl. 455—266 **2 Claims**



1. An AM receiver comprising:

a narrow band intermediate frequency amplifier;

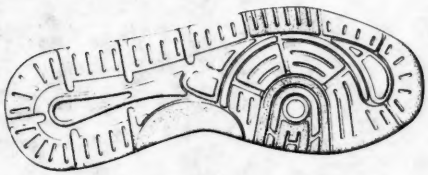
a first AM detector for detecting a signal from said narrow band amplifier to produce a first AM detection output signal A;

a wide band intermediate frequency amplifier;

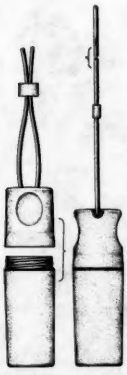
a second AM detector for detecting a signal from said wide band amplifier to produce a second AM detection output signal B; and

a circuit for combining said first and second AM detection output signals A and B at a coefficient a_M to produce an AM detection output $A(1-a_M)+a_MB$, where, $0 \leqq a_M \leqq 1$, the coefficient a_M being variable in said combining circuit.

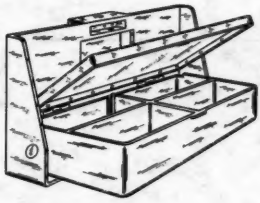
284,420
SHOE SOLE
James K. Tong, Beaverton, Oreg., assignor to Pensa, Inc., Portland, Oreg.
Filed Oct. 23, 1985, Ser. No. 790,375
Term of patent 14 years
U.S. Cl. D2—320



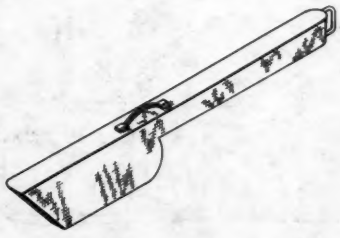
284,421
CONTAINER FOR STORING PERSONAL EFFECTS WHILE SWIMMING OR BATHING
Burt J. Siris, New York, N.Y., assignor to Sirco International Corp., Mt. Vernon, N.Y.
Filed Dec. 16, 1983, Ser. No. 562,082
Term of patent 14 years
U.S. Cl. D3—30.1



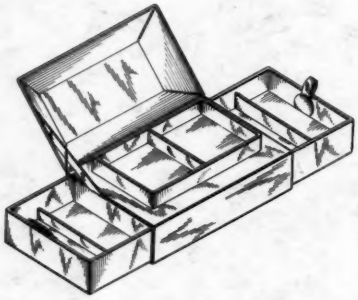
284,422
FLY BOX
Louis Pomaville, Muskegon, Mich., assignor to L & D Enterprise, Inc., Muskegon, Mich.
Filed Jul. 27, 1983, Ser. No. 517,815
Term of patent 14 years
U.S. Cl. D3—38



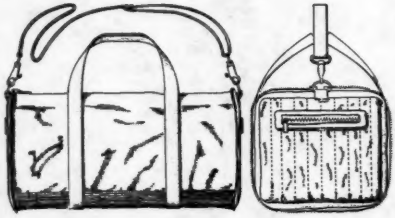
284,423
ROD AND REEL CASE
John A. McCallum, 2425 N. Rollin Hwy., Hudson, Mich. 49247
Filed Oct. 11, 1983, Ser. No. 540,923
Term of patent 14 years
U.S. Cl. D3—38



284,424
VANITY CASE
Georges Gotlib, New York, and Robert Goldman, Monsey, both of N.Y., assignors to Georges Gotlib, Inc., New York, N.Y.
Filed Nov. 7, 1983, Ser. No. 548,912
Term of patent 14 years
U.S. Cl. D3—39



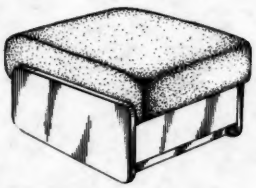
284,425
EXPANDABLE BAG
James H. Allen, Covington, Ky., assignor to 'totes', incorporated, Loveland, Ohio
Division of Ser. No. 365,082, Apr. 2, 1982, which is a continuation-in-part of Ser. No. 172,478, Jul. 25, 1980. This application Apr. 7, 1983, Ser. No. 482,972
Term of patent 14 years
U.S. Cl. D3—71



284,426
BELT BUCKLE HOLDER
George B. Morris, 41049 Pajaro Dr., Fremont, Calif. 94538
Continuation-in-part of Ser. No. 492,788, May 9, 1983, abandoned. This application Apr. 10, 1984, Ser. No. 598,907
Term of patent 14 years
U.S. Cl. D6—317

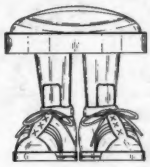
284,427
HOOK ATTACHMENT BOSS FOR A GARMENT HANGER
Robert A. Bredeweg, Zeeland, Mich., assignor to John Thomas Batts, Inc., Zeeland, Mich.
Division of Ser. No. 681,427, Dec. 13, 1984. This application Apr. 12, 1985, Ser. No. 722,465
Term of patent 14 years
U.S. Cl. D6—328

284,428
SEAT
William B. Raftery, Arlington, Tex., assignor to Steelcase, Inc., Grand Rapids, Mich.
Filed May 13, 1983, Ser. No. 494,120
Term of patent 14 years
U.S. Cl. D6—349

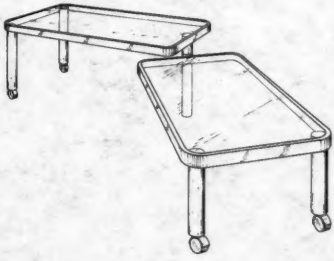


284,429
COMBINED CANE AND SEAT UNIT
Patria P. Garde, 61 Laurel La., Hammonton, N.J. 08037
Filed Oct. 28, 1983, Ser. No. 546,448
Term of patent 14 years
U.S. Cl. D6—368

284,430
DISPLAY CASE
Roy E. Satterfield, 309 Oak Park Dr., Knoxville, Tenn. 37918
Filed Sep. 27, 1983, Ser. No. 536,196
The portion of the term of this patent subsequent to Feb. 7, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—450



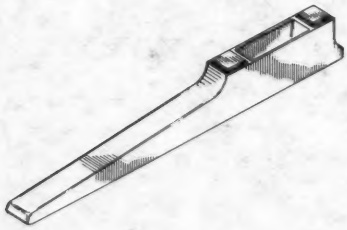
284,431
TABLE
Richard D. Berry, Jr., Hickory, N.C., assignor to Design Institute America, Inc., Montpelier, Ohio
Filed Jul. 11, 1983, Ser. No. 512,334
Term of patent 14 years
U.S. Cl. D6—479



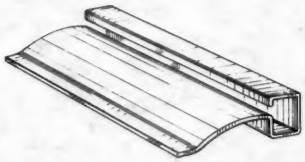
284,432
FURNITURE PANEL
Laura L. Hull, Huntington Beach, Calif., assignor to H. W. Hull & Sons, Inc., Gardena, Calif.
Filed Jan. 23, 1984, Ser. No. 572,863
Term of patent 14 years
U.S. Cl. D6—494

284,433
FURNITURE PANEL
Laura L. Hull, Huntington Beach, Calif., assignor to H. W. Hull & Sons, Inc., Gardena, Calif.
Filed Jan. 23, 1984, Ser. No. 572,864
Term of patent 14 years
U.S. Cl. D6—494

284,434
FURNITURE FOOT OR SIMILAR ARTICLE
Bruce K. Boundy, Holland, Mich., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Nov. 4, 1983, Ser. No. 549,126
Term of patent 14 years
U.S. Cl. D6—498

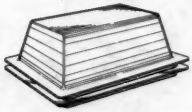


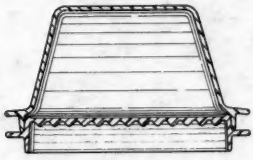
284,435
COMBINED SWATCH LEVELING AND BINDING CLIP
Harry Zelenko, and Marion Zelenko, both of 240 E. 61st St., New York, N.Y. 10021
Filed Mar. 24, 1983, Ser. No. 478,359
Term of patent 14 years
U.S. Cl. D6—512

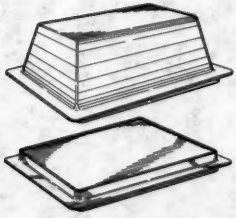


284,436
PILLOW
Janice D. Hodges, 11 Creekside, Irvine, Calif. 92715
Filed Apr. 6, 1984, Ser. No. 597,695
Term of patent 14 years
U.S. Cl. D6—601

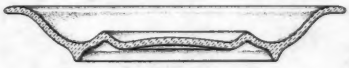
284,437
COVERED CHEESE SERVING TRAY OR THE LIKE
Mark P. Zieff, Lexington, and Rino Conti, Stoughton, both of Mass., assignors to Dart Industries Inc., Northbrook, Ill.
Filed Jun. 6, 1983, Ser. No. 501,330
Term of patent 14 years
U.S. Cl. D7—16



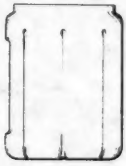




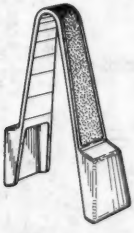
284,438
SAUCER
Robin Levien, London, England, assignor to American Commercial, Incorporated, Secaucus, N.J.
Filed Dec. 28, 1983, Ser. No. 566,217
Term of patent 14 years
U.S. Cl. D7—23



284,439
BEVERAGE CONTAINER HOLDER
Joseph J. Ventimiglia, St. Louis, and Lawrence R. Diener, Fenton, both of Mo., assignors to Sinclair & Rush, Inc., St. Louis, Mo.
Filed Dec. 16, 1983, Ser. No. 562,236
Term of patent 14 years
U.S. Cl. D9—70

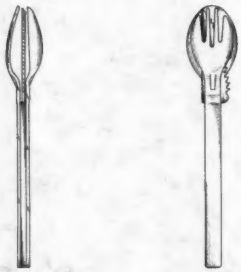


284,440
ICE TONGS OR THE LIKE
Mark P. Zieff, Lexington, Mass., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Jan. 31, 1984, Ser. No. 575,626
Term of patent 14 years
U.S. Cl. D7—105

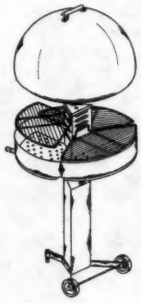


284,441
HOT DOG SLITTER
John R. Way, 1318 E. 37th St., Long Beach, Calif. 90807, assignor to John R. Way and Alice Benjamin, both of Glendale, Calif.
Filed Jan. 23, 1984, Ser. No. 572,852
Term of patent 14 years
U.S. Cl. D7—106

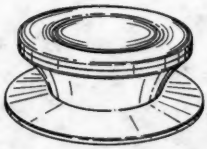
284,442
COMBINED KNIFE, FORK, AND SPOON SET
Chun-Man Chan, Hong Kong, Hong Kong, assignor to Space Lab (H.K.) Enterprises Limited, Wing On Centre, Hong Kong
Filed Mar. 6, 1984, Ser. No. 586,576
Claims priority, application United Kingdom, Sep. 6, 1983, 1 015 016
Term of patent 14 years
U.S. Cl. D7—148



284,443
BARBECUE
Neville W. Parlour, Fern Cottage, Clipston, Nr. Market Harborough, Leicestershire, England
Filed Oct. 31, 1983, Ser. No. 547,324
Term of patent 14 years
U.S. Cl. D7—334

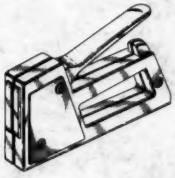


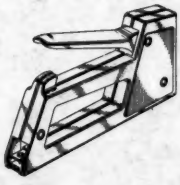
284,444
HANDLE FOR COOKING UTENSILS
Rolf Baumgarten, Neunkirchen-Wiederstein, Fed. Rep. of Germany, assignor to Heinrich Baumgarten KG Eisen and Blechwarenfabrik, both of Neunkirchen, Fed. Rep. of Germany
Filed Oct. 20, 1983, Ser. No. 543,944
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1983, MR 367; Jun. 20, 1983, MR 371
Term of patent 14 years
U.S. Cl. D7—393



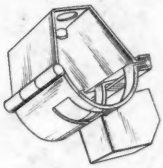
284,445
WARMER FOR A FOOD DISPENSER SPOUT
Alfred W. Wickesberg, 1453 Heather Cir., Hubertus, Wis. 53033
Filed Jul. 15, 1983, Ser. No. 514,040
Term of patent 14 years
U.S. Cl. D7—397

284,446
TACKER
Lars-Göran Rosenblad, Grönna, Sweden, assignor to Isaberg AB, Hestra, Sweden
Filed Feb. 25, 1983, Ser. No. 469,892
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1982, URA 1466/82
Term of patent 14 years
U.S. Cl. D8—49

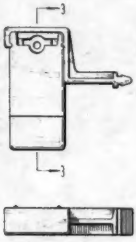




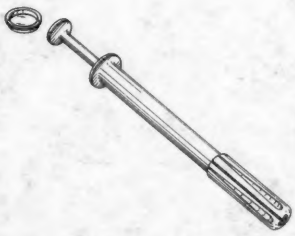
284,447
STEERING COLUMN LOCK
Hugh J. Webster, 21482 Ellacott, Apt. 207, Warrensville Heights, Ohio 44127
Filed Jul. 20, 1984, Ser. No. 632,900
Term of patent 14 years
U.S. Cl. D8—331



284,448
DRAPERY ROD SUPPORT BRACKET
Terence A. Cox; Paul M. Johnson, and Philip C. Horton, all of Tamworth, England, assignors to Swish Products Limited, Staffordshire, England
Filed Sep. 7, 1983, Ser. No. 529,994
Claims priority, application United Kingdom, Jun. 20, 1983, 1013661
Term of patent 14 years
U.S. Cl. D8—363

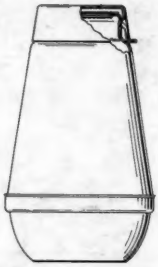


284,449
WALL ANCHOR
Anders Lindell, Jönåker, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden
Filed Jul. 22, 1983, Ser. No. 516,307
Claims priority, application Sweden, Jan. 27, 1983, 83-0227
Term of patent 14 years
U.S. Cl. D8—385



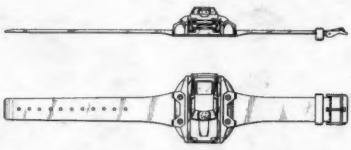
284,450
PACKING BOX
Kiyoshi Suzuki, Tokyo, and Norio Osawa, Kanagawa, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Dec. 19, 1983, Ser. No. 562,521
Claims priority, application Japan, Sep. 5, 1983, 58-38666
Term of patent 14 years
U.S. Cl. D9—332

284,451
PACKAGING CONTAINER
Vincent E. Fortuna, Huntington Beach, Calif., assignor to Cosden Technology, Inc., Dallas, Tex.
Filed Feb. 27, 1984, Ser. No. 584,063
Term of patent 14 years
U.S. Cl. D9—353



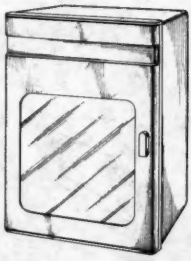
284,452
POURING LIP
Benjamin E. McKay, 1540 Billings E-4, Aurora, Colo. 80011
Filed Jun. 6, 1983, Ser. No. 501,103
Term of patent 14 years
U.S. Cl. D9—434

284,453
COMBINED WRIST WATCH AND TOY VEHICLE
Shigeru Nakane, Narashino, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed May 9, 1984, Ser. No. 608,374
Term of patent 14 years
U.S. Cl. D10—33

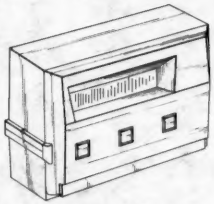


284,454
TIMER
Dan E. Gremonprez, West Bend, Wis., and William C. Cesaroni, Glenview, Ill., assignors to Dart Industries Inc., Northbrook, Ill.
Filed Feb. 17, 1984, Ser. No. 581,493
Term of patent 14 years
U.S. Cl. D10—40

284,455
INSTRUMENT CASING FOR GRAPHIC RECORDER OR THE LIKE
William J. Cooper, Los Angeles, and Richard J. Spady, Claremont, both of Calif., assignors to International Telephone & Telegraph Corp., New York, N.Y.
Filed Jun. 6, 1983, Ser. No. 502,864
Term of patent 14 years
U.S. Cl. D10—46

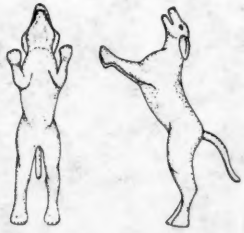


284,456
FLUID METER ELECTRONIC FLOW CORRECTOR MODULE COVER
Norman Porter, Sellersville, Pa., assignor to American Meter Company, Philadelphia, Pa.
Filed May 10, 1983, Ser. No. 493,397
Term of patent 14 years
U.S. Cl. D10—103

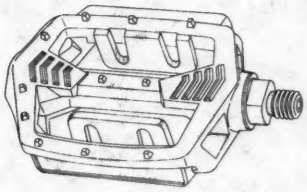


284,457
DIAL AND CROWN UNIT FOR A CLOCK
Terry A. Mervau, Holland, Mich., assignor to Mervau, Incorporated, Holland, Mich.
Filed Nov. 3, 1983, Ser. No. 548,513
Term of patent 14 years
U.S. Cl. D10—124

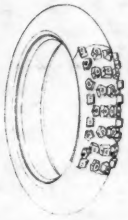
284,458
FIGURINE
Oliver S. Close, 541 Road 1041, Nova, Ohio 44859
Filed Feb. 2, 1983, Ser. No. 463,321
Term of patent 14 years
U.S. Cl. D11—158



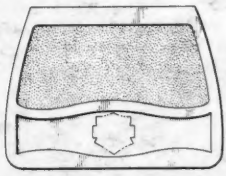
284,459
PEDAL FOR A BICYCLE
Koji Shimizu, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan
Filed Jun. 22, 1983, Ser. No. 506,823
Claims priority, application Japan, Dec. 28, 1982, 57-59348
Term of patent 14 years
U.S. Cl. D12—125



284,460
VEHICLE TIRE
Hiroshi Kojima; Junichi Kawajiri, and Toshio Hayakawa, all of Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed Jan. 7, 1983, Ser. No. 456,656
Claims priority, application Japan, Jul. 23, 1982, 57-33123
Term of patent 14 years
U.S. Cl. D12—140



284,461
MOTORCYCLE MUDFLAP
Alwin J. Stahel, St. Paul, Minn., assignor to Drag Specialties, Inc., Minnetonka, Minn.
Continuation-in-part of Ser. No. 302,080, May 26, 1982, abandoned. This application Jul. 13, 1984, Ser. No. 630,438
Term of patent 14 years
U.S. Cl. D12—185

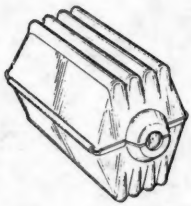


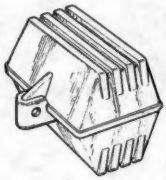
284,462
REAR VIEW MIRROR FOR ATTACHMENT TO A CRASH HELMET
John W. Greenlaw, 3140 Buskirk Ave., Walnut Creek, Calif. 94546; Karsten Kettlitz, San Leandro, and Gary Schlueter, Castro Valley, both of Calif., assignors to John W. Greenlaw, Walnut Creek, Calif.
Filed Aug. 27, 1984, Ser. No. 644,861
Term of patent 14 years
U.S. Cl. D12—189

284,463
BATTERY CONTAINER
Nancy J. Perkins, Schaumberg; Charles D. Dushek, Lisle, both of Ill., and Roy E. Hennen, Mequon, Wis., assignors to Globe-Union Inc., Milwaukee, Wis.
Filed Jul. 5, 1983, Ser. No. 510,734
Term of patent 14 years
U.S. Cl. D13—9

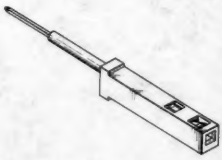
284,464
RING-LUG TERMINAL WITH ATTACHED MAGNET
Edwin Z. Gabriel, 91 Mt. Tabor Way, Ocean Grove, N.J. 07756
Filed Feb. 22, 1983, Ser. No. 468,472
Term of patent 14 years
U.S. Cl. D13—24

284,465
LOCKABLE HOUSING FOR SECURING ELECTRICAL PLUGS
Joseph P. Epley, Milford, Mich., assignor to The Budd Company, Troy, Mich.
Filed Apr. 26, 1983, Ser. No. 488,873
Term of patent 14 years
U.S. Cl. D13—24

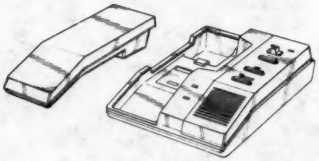




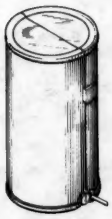
284,466
LOCKING CLIP PIN EXTENDER
Daniel J. Crowley, Harrisburg, and James M. English, Coplay, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Nov. 21, 1983, Ser. No. 553,898
Term of patent 14 years
U.S. Cl. D13—24



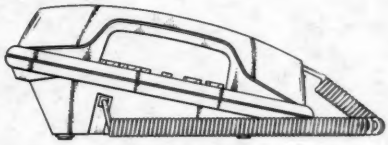
284,467
TELEPHONE ANSWERING MACHINE
Haruo Baba, Kanagawa; Teisuke Kurosu, Tokyo; Fumiharu Ohta, Kanagawa; Kazumasa Takenaka, Kanagawa, and Satoshi Watanabe, Kanagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed May 9, 1983, Ser. No. 492,758
Claims priority, application Japan, Nov. 12, 1982, 57-51368
Term of patent 14 years
U.S. Cl. D14—52



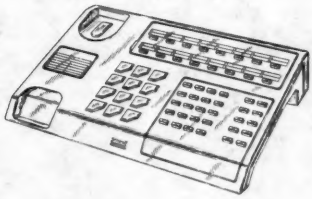
284,468
TELEPHONE
Michael Matras, 7520 N. Fairchild, Fox Point, Wis. 53217
Filed Feb. 13, 1984, Ser. No. 579,257
Term of patent 14 years
U.S. Cl. D14—53



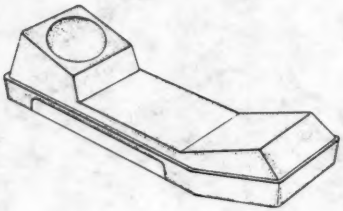
284,469
TELEPHONE
Teturo Ando, Tokyo, Japan, assignor to Kabushikikaisha Taikodenki Seisakusho, Tokyo, Japan
Filed Sep. 27, 1983, Ser. No. 536,339
Claims priority, application Japan, Mar. 31, 1983, 58-13572
Term of patent 14 years
U.S. Cl. D14—58

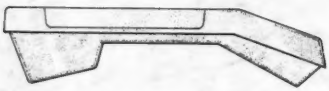


284,470
TELEPHONE STAND WITH DIALING MEANS
Julian M. Abrams, Chilwell, England, assignor to Plessey Overseas Limited, Ilford, England
Filed Dec. 14, 1983, Ser. No. 561,377
Claims priority, application United Kingdom, Jul. 19, 1983, 1014192
Term of patent 14 years
U.S. Cl. D14—60

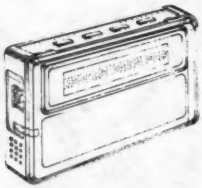


284,471
TELEPHONE HANDSET
Christian J. Felix, Flushing, N.Y.; Donald M. Genaro, Haworth, N.J., and Gordon E. Sylvester, Jamaica, N.Y., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.
Filed Apr. 29, 1985, Ser. No. 728,415
Term of patent 14 years
U.S. Cl. D14—63

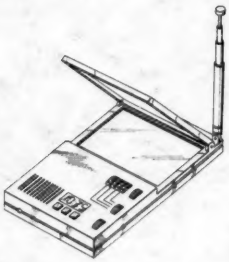




284,472
DIGITAL DISPLAY PAGER
Takeshi Nakatani, and Nagakazu Yokoyama, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Mar. 19, 1984, Ser. No. 590,606
Claims priority, application Japan, Sep. 20, 1983, 58-40839; Mar. 6, 1984, 59-8471
Term of patent 14 years
U.S. Cl. D14—68

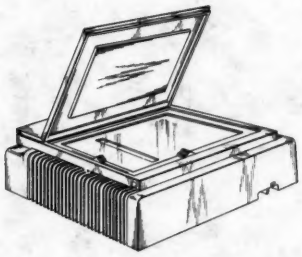


284,473
PORTABLE TELEVISION SET
Yutaka Ohtsu, Kanagawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Jan. 9, 1984, Ser. No. 569,214
Claims priority, application Japan, Nov. 30, 1983, 58-51962
Term of patent 14 years
U.S. Cl. D14—77

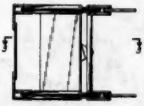


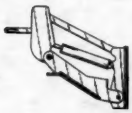
284,474
PORTABLE COMPUTER
Masaji Sawada, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Oct. 28, 1983, Ser. No. 546,412
Claims priority, application Japan, Apr. 30, 1983, 58-18770
Term of patent 14 years
U.S. Cl. D14—100

284,475
IMAGE SCANNER
Yoshiyuki Manabe, Yamato, Japan, assignor to IBM International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 27, 1984, Ser. No. 594,041
Claims priority, application Japan, Sep. 28, 1983, 58-41860
Term of patent 14 years
U.S. Cl. D14—107

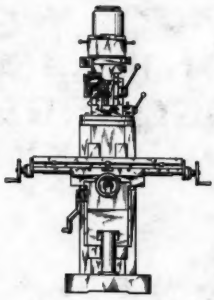


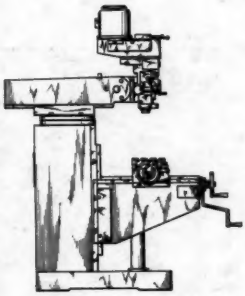
284,476
RAISABLE PLOW HITCH ASSEMBLY
Fred Boschen, and Henry Boschen, both of Edmond, Okla., assignors to Carrier King, Inc., Edmond, Okla.
Filed Oct. 29, 1982, Ser. No. 437,682
Term of patent 14 years
U.S. Cl. D15—28



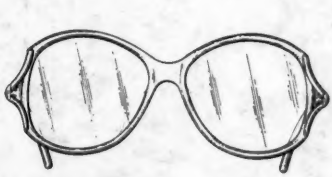


284,477
TURRET MILLING MACHINE
J. H. Chen, Taichung, Taiwan, assignor to Yeong Chin Machinery Industries Co., Ltd., Taichung, Taiwan
Filed Mar. 1, 1983, Ser. No. 471,154
Term of patent 14 years
U.S. Cl. D15—131



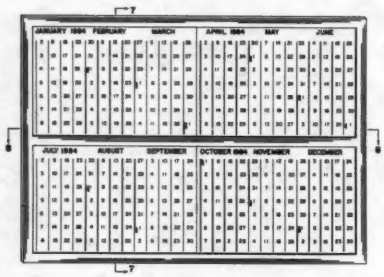


284,478
EYEGLASS FRAME
Ulrich J. Haas, Vienna, Austria, assignor to Optyl Eyewear Fashion International Corp., Norwood, N.J.
Filed Aug. 23, 1984, Ser. No. 643,818
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1984, 13 776
Term of patent 14 years
U.S. Cl. D16—102

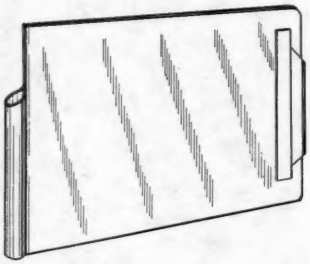


284,479
FONT OF TYPE
Xavier de Bascher, Paris, France, assignor to Jungle Jap, Paris, France
Filed May 17, 1983, Ser. No. 495,443
Claims priority, application France, Nov. 17, 1982, 82-3976
Term of patent 14 years
U.S. Cl. D18—24

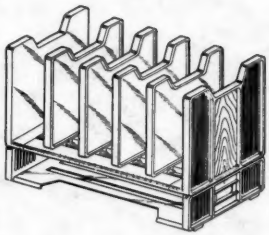
284,480
WALL CALENDAR
Scott Wallgren, P.O. Box 431, Carver, Mass. 02330
Filed Mar. 29, 1984, Ser. No. 594,997
Term of patent 14 years
U.S. Cl. D19—20

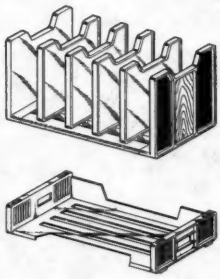


284,481
HOLDER FOR A RULE BOOK AND SCORE CARD
Roy C. Draddy, 9 Dunfries Pl., Floreat Park, Australia
Continuation-in-part of Ser. No. 230,282, Jan. 30, 1981, Pat. No. Des. 269,625. This application Mar. 8, 1983, Ser. No. 473,680
The portion of the term of this patent subsequent to Jul. 5, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D19—26

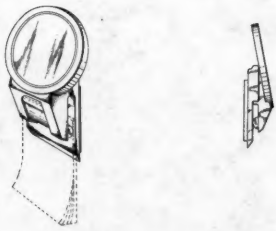


284,482
COMBINED VERTICAL SORTER AND LETTER TRAY
Jam Sun, Taipei, Taiwan, assignor to Sun Office Products, Inc., Taipei, Taiwan
Filed Feb. 8, 1983, Ser. No. 465,039
Term of patent 14 years
U.S. Cl. D19—90

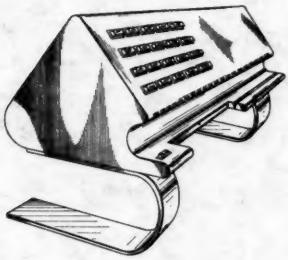




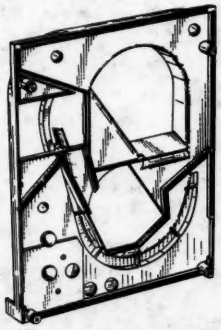
284,483
NOTE PAD HOLDER
Dwight J. Yang, 2347 W. 233rd St., Torrance, Calif. 90501
Filed Dec. 28, 1983, Ser. No. 566,428
Term of patent 14 years
U.S. Cl. D19—91



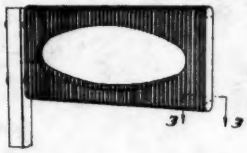
284,484
MAG CARD ACTIVATED COUPON LABEL DISPENSER
Floyd H. Haker, 6546 Linden La., Dallas, Tex. 75230
Filed Jun. 20, 1983, Ser. No. 506,066
Term of patent 14 years
U.S. Cl. D20—2



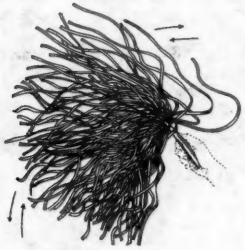
284,485
HOUSING PART FOR A COIN DISPENSER
Timothy W. Tod, Abergavenny; Roger J. Tod, Crickhowell, both of Wales, and Robert D. Bellis, Delph Nr. Oldham, England, assignors to Coin Controls Limited, Lancashire, England
Filed Aug. 19, 1983, Ser. No. 524,766
Claims priority, application United Kingdom, Jun. 15, 1983, 1013568
Term of patent 14 years
U.S. Cl. D20—9



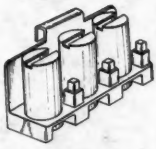
284,486
DISPLAY SIGN
Ronald G. Gransden, Eltham Heights, England, assignor to Ford Motor Company, Dearborn, Mich.
Filed Mar. 18, 1983, Ser. No. 476,686
Claims priority, application United Kingdom, Sep. 22, 1982, 1 008 828
Term of patent 14 years
U.S. Cl. D20—42



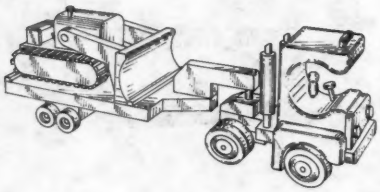
284,487
AURAL/VISUAL SIGNALLING INSTRUMENT
Richard J. Pratt, 1390 Carol La., Deerfield, Ill. 60015
Filed May 20, 1983, Ser. No. 496,665
Term of patent 14 years
U.S. Cl. D21—100



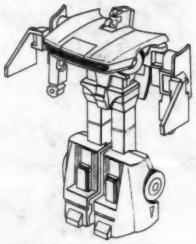
284,488
TOY CHANGE DISPENSER
M. Allyson Smith, Elma, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 2, 1984, Ser. No. 576,356
Term of patent 14 years
U.S. Cl. D21—109



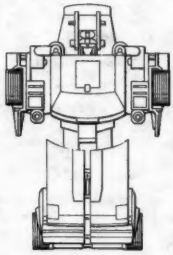
284,489
COMBINED TOY TRACTOR, TRAILER AND BULLDOZER
John A. Dorelli, 315 Rose St., Glenwood, Ill. 60425
Filed Apr. 2, 1984, Ser. No. 595,598
Term of patent 14 years
U.S. Cl. D21—134

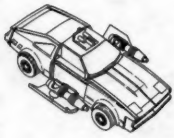


284,490
RECONFIGURABLE TOY VEHICLE
Kouzin Ohno, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed May 30, 1984, Ser. No. 616,424
Claims priority, application Japan, Dec. 30, 1983, 58-57472
Term of patent 14 years
U.S. Cl. D21—136

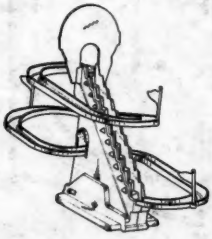


284,491
RECONFIGURABLE TOY VEHICLE
Kouzin Ohno, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed May 30, 1984, Ser. No. 616,600
Claims priority, application Japan, Dec. 30, 1983, 58-57470
Term of patent 14 years
U.S. Cl. D21—136



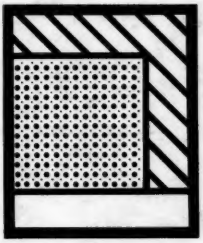


284,492
TOY TRACKWAY
Yoshio Udagawa, 3-13, 3-Chome, Mama Ichikawa-Shi, Chiba-Ken, Japan
Filed Oct. 6, 1983, Ser. No. 539,526
Claims priority, application Japan, Apr. 11, 1983, 58-014924
Term of patent 14 years
U.S. Cl. D21—143

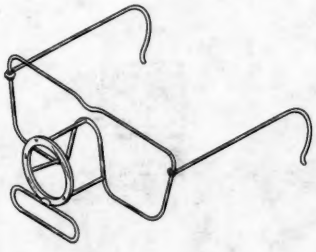


284,493
BALL
David G. King, 39 Betsy B Ave., Somerset, Mass. 02725
Filed Sep. 15, 1983, Ser. No. 532,508
Term of patent 14 years
U.S. Cl. D21—204

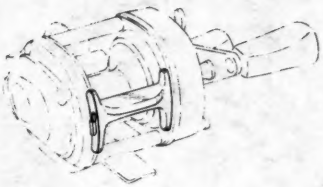
284,494
GOLF INSTRUCTIONAL MAT OR THE LIKE
Paul J. Williamson, Dunes Station, P.O. Box 7095, Myrtle Beach, S.C. 29577
Filed May 19, 1983, Ser. No. 496,314
Term of patent 14 years
U.S. Cl. D21—234



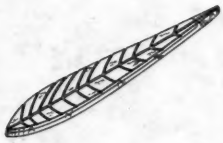
284,495
NOVELTY AMUSEMENT EYEGLASSES
Tommy F. Duke, 4221 Longleaf Dr., Garland, Tex. 75042
Filed Sep. 30, 1983, Ser. No. 537,688
Term of patent 14 years
U.S. Cl. D21—240



284,496
FISHING REEL CLUTCH LEVER
Kyoichi Kaneko, and Hideo Nakamura, both of Tokyo, Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan
Filed Dec. 30, 1983, Ser. No. 567,015
Claims priority, application Japan, Jul. 7, 1983, 58-29448
Term of patent 14 years
U.S. Cl. D22—25

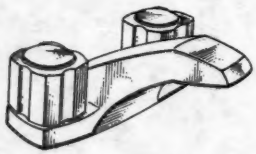


284,497
ARTIFICIAL FISHING STRIP
John P. Millroy, 4300 NE. 18th Ave., Oakland Park, Fla. 33308
Filed May 15, 1985, Ser. No. 734,140
Term of patent 14 years
U.S. Cl. D22—27

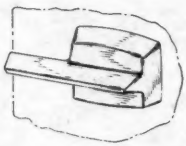


284,498
GAS GOVERNOR MODULE
Derek Stoves, and John E. Hatley, both of Newcastle upon Tyne, England, assignors to British Gas Corporation, London, England
Filed Jan. 4, 1984, Ser. No. 568,217
Claims priority, application United Kingdom, Jul. 4, 1983, 1013906
Term of patent 14 years
U.S. Cl. D23—21

284,499
FAUCET
Holly K. Yost, Van Nuys, Calif., assignor to Price Pfister, Inc., Pacoima, Calif.
Filed Jun. 24, 1983, Ser. No. 507,524
Term of patent 14 years
U.S. Cl. D23—25

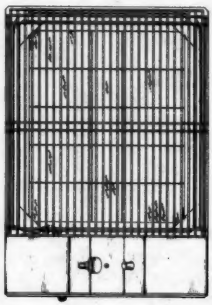


284,500
PLUMBING FITTING HANDLE
Edwin F. Bolgert, Kohler, and Paul P. Kolada, Sheboygan, both of Wis., assignors to Kohler Co., Kohler, Wis.
Filed Apr. 24, 1984, Ser. No. 603,344
Term of patent 14 years
U.S. Cl. D23—29

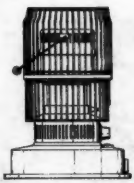


284,501
FIRE-PLACE FOR SOLID FUEL
Niels-Erik Heger, Jessheim, Norway, assignor to Aksjeselskapet Jotul, Oslo, Norway
Filed May 3, 1983, Ser. No. 491,306
Claims priority, application Norway, Jan. 14, 1983, 63 672
Term of patent 14 years
U.S. Cl. D23—97

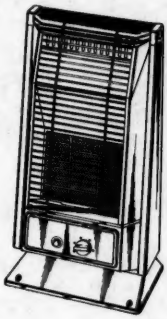
284,502
CATALYTIC SPACE HEATER
Rodney W. Sieck, Leawood, Kans., assignor to Therm'x Corporation, Ill.
Filed Sep. 19, 1983, Ser. No. 533,211
Term of patent 14 years
U.S. Cl. D23—110



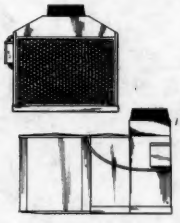
284,503
OIL-FIRED SPACE HEATER
Kazuharu Nakamura, Nagoya, Japan, assignor to Toyotomi Kogyo Co., Ltd., Aichi, Japan
Filed Jul. 19, 1984, Ser. No. 632,304
Term of patent 14 years
U.S. Cl. D23—121



284,504
STOVE
Kenzo Okamoto, and Koichi Sakai, both of Osaka, Japan, assignors to Imanishi Kinzoku Kogyo Kabushiki Kaisha (Imarflex Mfg. Co., Ltd.), Japan
Filed Aug. 31, 1983, Ser. No. 528,071
Claims priority, application Japan, Jul. 15, 1983, 58-30599
Term of patent 14 years
U.S. Cl. D23—122



284,505
TWO-STAGE EVAPORATIVE COOLER OR SIMILAR ARTICLE
John Bowman, Tempe, and Roy T. Otterbein, Phoenix, both of Ariz., assignors to Arvin Industries, Inc., Columbus, Ind.
Filed Sep. 6, 1983, Ser. No. 529,529
Term of patent 14 years
U.S. Cl. D23—139



284,506
WALL HOUSING FOR AN AEROSOL SPRAY DISPENSER
Walter Gutknecht, Balsthal, Switzerland, assignor to Papierfavrik Balsthal, Balsthal, Switzerland
Filed Jul. 15, 1983, Ser. No. 514,348
Claims priority, application World Int. Prop. O., Jan. 20, 1983, DM/002 163
Term of patent 14 years
U.S. Cl. D23—150

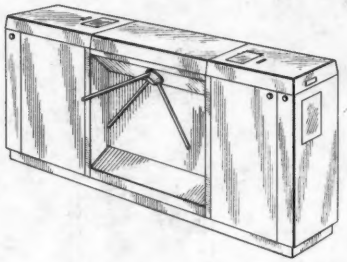
284,507
MEDICAL PERCUSSION HAMMER OR THE LIKE
Norbert Leopoldi, Chicago, Ill., assignor to Cloverline, Inc., Chicago, Ill.
Filed Sep. 12, 1983, Ser. No. 531,070
Term of patent 14 years
U.S. Cl. D24—17

284,508
TONOMETER
Ikuya Enatsu, No. 12-6, Saginomiya 5-chome, Nakano-ku, Tokyo, Japan
Filed Nov. 21, 1983, Ser. No. 553,406
Claims priority, application Japan, May 30, 1983, 58-22697
Term of patent 14 years
U.S. Cl. D24—21

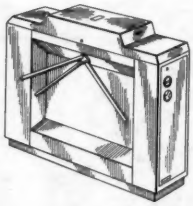
284,509
SURGICAL STAPLE
Lanny L. Johnson, 3800 S. Hagadorn Rd., Okemos, Mich. 48864
Filed Feb. 22, 1983, Ser. No. 468,600
Term of patent 14 years
U.S. Cl. D24—29

284,510
SURGICAL RETRACTOR
Clyde R. Pratt, Somis; Roger G. Carignan, Moorpark; David M. Martinez, Manhattan Beach, and Michael L. Schiffman, Los Angeles, all of Calif., assignors to Techmedica, Inc., Camarillo, Calif.
Filed Oct. 11, 1983, Ser. No. 540,482
Term of patent 14 years
U.S. Cl. D24—27

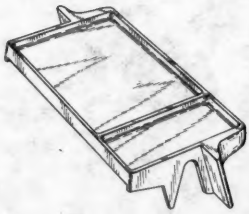
284,511
FARE COLLECTION GATE
Billy G. Smith, Lakeside, Calif., assignor to Cubic Western Data, San Diego, Calif.
Filed Apr. 23, 1984, Ser. No. 603,170
Term of patent 14 years
U.S. Cl. D25—51



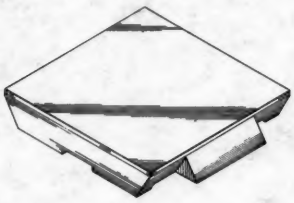
284,512
FARE PROCESSING GATE UNIT
Billy G. Smith, Lakeside, Calif., assignor to Cubic Western Data, San Diego, Calif.
Filed Jun. 6, 1984, Ser. No. 617,899
Term of patent 14 years
U.S. Cl. D25—51



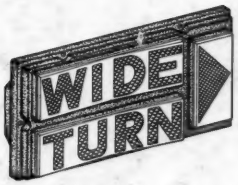
284,513
EXTENSION LADDER SHELF
Richard A. Dyer, 10115 NE. 16th St., Vancouver, Wash. 98664
Filed Aug. 1, 1983, Ser. No. 519,379
Term of patent 14 years
U.S. Cl. D25—68



284,514
REVETMENT BLOCK
Francis M. McPoyle, Maple Glen, Pa., assignor to Atlas Corporation, Princeton, N.J.
Filed Apr. 11, 1983, Ser. No. 484,115
Term of patent 14 years
U.S. Cl. D25—80



284,515
VEHICLE TURN SIGNAL LIGHT
Dennis R. Beard, 700 W. Ridgeway, Waterloo, Iowa 50701; Donald E. Jensen, 141 S. Jefferson, Hudson, Iowa 50643; James L. Juhl, 237 Crestview Ave., Waterloo, Iowa 50701, and Mark W. Taylor, 6710 Eldora Rd., Hudson, Iowa 50643
Filed Feb. 17, 1983, Ser. No. 467,351
Term of patent 14 years
U.S. Cl. D26—30



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 1ST DAY OF JULY, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.G.S., Inc.: *See*—
Birkhauser, Robert R., III, 4,597,727, Cl. 425-12.000.

A. H. Robins Company, Incorporated: *See*—
Shanklin, James R., Jr.; and Johnson, Christopher P., III, 4,597,902, Cl. 262-239.00B.

A.R.A. Manufacturing Company: *See*—
Burney, Charles F., 4,597,465, Cl. 180-176.000.

Aalto, William R.; and Ruschke, Rick R., to Baxter Travenol Laboratories, Inc. Sealing closure for a Luer fitting in open communication with a pressurized liquid supply. 4,597,758, Cl. 604-256.000.

Abe, Akira; and Terae, Nobuyuki, to Shin-Etsu Chemical Co., Ltd. Composition containing organopolysiloxane having polyoxyalkylene and perfluoroalkyl units. 4,597,894, Cl. 252-358.000.

Abeles, Benjamin: *See*—
Tiedje, J. Thomas; and Abeles, Benjamin, 4,598,164, Cl. 136-249.000.

Aberegg, Richard E., to Koehring Morgan. Hoist with redundant safety features. 4,597,497, Cl. 212-147.000.

Abo, Keiju: *See*—
Tanaka, Yoshikazu; Yamamuro, Sigeaki; Abo, Keiju; Kumura, Haruyoshi; Hirano, Hiroyuki; and Morimoto, Yoshiro, 4,597,308, Cl. 74-866.000.

Ackman, C. F. Douglas: *See*—
Kihn, Harry; and Ackman, C. F. Douglas, 4,597,379, Cl. 128-1.00R.

Adachi, Tatsuya: *See*—
Nikaido, Masataka; Kawamoto, Kinji; Murase, Kazuhiro; Kaneaki, Tetsuhiko; Adachi, Tatsuya; and Matsuda, Sakurako, 4,597,318, Cl. 84-1.220.

Adair, Brenda A.; and Stevens, Kent A., to Creative Planters Inc. Plant receptacle. 4,597,221, Cl. 47-66.000.

Adam, Jean-Marie, to Ciba-Geigy Corporation. 3(5-tetrazolyl)1,4-diaminoanthraquinones. 4,598,155, Cl. 548-253.000.

Adam, Timothy S.: *See*—
Burton, James O.; Adam, Timothy S.; Budziak, Frank W.; and Nekoloff, Michael W., 4,598,376, Cl. 364-470.000.

Adams, John T.; and Bohan, John E., Jr., to Honeywell Inc. Printed wiring board means with integral dew sensor. 4,598,333, Cl. 361-286.000.

Advanced Cardiovascular Systems, Inc.: *See*—
Samson, Wilfred J.; and Gandhi, Deepak R., 4,597,755, Cl. 604-96.000.

Advanced Micro Devices, Inc.: *See*—
Chuang, Patrick T.; and Marr, George, 4,598,387, Cl. 365-149.000.

AFA Consolidated Corporation: *See*—
Licari, Anthony, 4,597,511, Cl. 222-380.000.

Agency of Industrial Science & Technology: *See*—
Tanaka, Kazunobu; Matsuda, Akihisa; and Yoshida, Toshihiko, 4,598,304, Cl. 357-4.000.

Agfa-Gevaert N.V.: *See*—
Buelens, Edward; and Goossens, Carolus C., 4,597,658, Cl. 354-275.000.

Agrimac di Bartolini Mauro: *See*—
Bartolini, Mauro, 4,597,703, Cl. 414-24.600.

Aguglia, Gianluigi. Mechanical-electromagnetic pressure sensor. 4,597,286, Cl. 73-146.500.

Ahne, Hellmut, to Siemens Aktiengesellschaft. Preparation of polyimide and polyisoindoloquinazoline dione relief structures. 4,598,038, Cl. 430-283.000.

Ahola, Clifford J.: *See*—
Tloczynski, James J.; Budzol, Melvin; Ahola, Clifford J.; and Rine, James C., 4,597,536, Cl. 241-62.000.

Ainsworth, George: *See*—
Ainsworth, Michael, 4,598,339, Cl. 362-72.000.

Ainsworth, Michael, to Ainsworth, George; Ainsworth, Mina; and Ainsworth, Robert, part interest to each. Light wand assembly for bicycles, motorbikes, etc. 4,598,339, Cl. 362-72.000.

Ainsworth, Mina: *See*—
Ainsworth, Michael, 4,598,339, Cl. 362-72.000.

Ainsworth, Robert: *See*—
Ainsworth, Michael, 4,598,339, Cl. 362-72.000.

Aioi Seiki K.K.: *See*—
Yonezawa, Keitaro, 4,597,709, Cl. 414-401.000.

Air Products and Chemicals, Inc.: *See*—
Carr, Richard V. C.; Sawicki, John E.; and Toseland, Bernard A., 4,597,875, Cl. 210-710.000.
Fenstermaker, Michael L.; and Pellman, Mark A., 4,597,807, Cl. 148-16.500.
Ford, Michael E.; and Johnson, Thomas A., 4,597,911, Cl. 558-29.000.

Aisin Seiki Co., Ltd.: *See*—
Shirasishi, Daiichi; Iwasaki, Eiji; and Fukumoto, Ryoichi, 4,597,223, Cl. 49-352.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Hirashiba, Yuji; Kawai, Shinji; and Oguma, Tomio, 4,597,111, Cl. 4-420.400.
Nishimura, Takumi; and Shibata, Hirochika, 4,597,611, Cl. 303-116.000.
Oumi, Takeharu; and Nakazawa, Hideo, 4,597,381, Cl. 128-6.000.

Aitken, Edward R. Powder sifter and dispenser. 4,597,358, Cl. 118-24.000.

Akers, Francis I.: *See*—
Karbassiyoon, Kamran; Akers, Francis I.; Raplee, Larry J.; and Fletcher, Daniel G., 4,597,785, Cl. 65-2.000.

Aktiebolaget Bofors: *See*—
Bolinder, Boo; and Schmid, Hermann, 4,597,994, Cl. 427-213.000.

Aktiebolaget Electrolux: *See*—
Andreasson, Bo C., 4,597,373, Cl. 123-630.000.

Aktiebolaget SKF: *See*—
Lachonius, Leif; and Ullberg, Carl, 4,597,492, Cl. 198-852.000.

Aktieselskabet Jens Villadsens Fabriker: *See*—
Larsen, Ebbe D., 4,597,817, Cl. 156-280.000.

Akzo NV: *See*—
Hoefs, Cornelis A. M., 4,598,108, Cl. 523-411.000.
Roorda, Herm J.; and Jipping, Max J., 4,597,797, Cl. 106-194.000.
Wick, Gerhard, 4,598,136, Cl. 528-56.000.

Albany International Corp.: *See*—
Scarano, Robert V., 4,598,238, Cl. 318-282.000.

Albertsson, Stig L. Snow making machine. 4,597,524, Cl. 239-14.000.

Albrecht, Jiri; and Mrstina, Vaclav, to MOTOTRANS narodny podnik. Industrial filter. 4,597,784, Cl. 55-378.000.

Aleem, Mohd A.; Lobsinger, James L.; and Wefel, Jerry D., to Sundstrand Corporation. High speed rotor with removable can. 4,598,218, Cl. 310-42.000.

Alexander, Gabriel G.: *See*—
Roche, Joseph R.; Alexander, Gabriel G.; and Carbaugh, William L., 4,597,447, Cl. 166-347.000.

Alexander, Steven G. Storage/dispenser rack for rectangular articles. 4,597,614, Cl. 312-42.000.

Alexanderson, Johan; and Skarendahl, Ake. Leveling composition. 4,597,802, Cl. 106-315.000.

Alfa Romeo Auto S.p.A.: *See*—
De Angelis, Giancarlo; Saglimbeni, Renato; and Mainardi, Riccardo, 4,598,371, Cl. 364-431.040.

Aliberti, Vincent A.; Kruse, Robert L.; and Valcarce, Eduardo M., to Monsanto Company. Mass polymerization process for ABS polyblends. 4,598,124, Cl. 525-86.000.

Allen, Henry C.; and Clarke, Frederick W., to United States of America, Army. Tetra-alkyl titanates as bonding agents for thermoplastic propellants. 4,597,924, Cl. 264-3.600.

Allen, Jackie C., to Chevron Research Company. Hydraulic punch tool for heat exchangers. 4,597,180, Cl. 30-366.000.

Allen, Joseph C.: *See*—
Ware, Charles H.; Rose, Leslie C.; and Allen, Joseph C., 4,597,441, Cl. 166-261.000.

Allied Corporation: *See*—
Berkovich, Semyon; Wilson, Colleen R.; and Walter, Chris J., 4,598,411, Cl. 375-27.000.
Brandt, David S.; and Costello, Samuel J., 4,597,281, Cl. 72-318.000.
Campbell, Donald N.; Vora, Kishore N.; and Davis, Robert C., Jr., 4,597,299, Cl. 73-864.810.

Almaula, Bipin C., to United States of America, Army. Process of mass transfer and material separation using a microchannel plate. 4,597,873, Cl. 210-649.000.

Almaula, Bipin C., to United States of America, Army. Mass transfer and material separation microchannel plate apparatus. 4,597,947, Cl. 422-191.000.

Alsthom-Atlantique: *See*—
Obrecht, Georges, 4,597,289, Cl. 73-151.000.

Aluminium Pechiney: *See*—
Fabre, Jean; Lavalou, Eric; and Nicolas, Francois, 4,597,952, Cl. 423-122.000.

Aluminum Company of America: *See*—
Bush, J. Finley, 4,597,953, Cl. 423-132.000.
Ramser, Robert A.; Barch, Daniel R.; Buchovecky, Kalman E.; and Kuchera, Ray A., 4,597,919, Cl. 264-12.000.

Aluminum Pechiney: *See*—
Cohen, Joseph; Gurtner, Bernard; and Bertaud, Yves, 4,597,840, Cl. 204-67.000.

Alyfuku, Kiyoshi: *See*—
Suda, Yasuo; Alyfuku, Kiyoshi; Sunouchi, Akio; and Suzuki, Nobuyuki, 4,597,659, Cl. 354-409.000.

Amada Metrecs Company, Limited: *See*—
Kasai, Shigeo, 4,597,145, Cl. 29-51.000.

Ament, Frank, to General Motors Corporation. Engine idle speed control system. 4,597,368, Cl. 123-339.000.

American Cast Iron Pipe Company: *See*—
Snow, William E.; and Warren, Thomas R., 4,597,995, Cl. 427-231.000.

American Cyanamid Company: *See*—
Chang, Eugene Y. C., 4,598,103, Cl. 521-126.000.
Goupil, Dennis W.; and Musolino, Mary T., 4,597,843, Cl. 204-165.000.

American Hospital Supply Corp: *See*—
Raible, Donald A., 4,597,756, Cl. 604-175.000.

American Hospital Supply Corporation: *See*—
Hilal, Said S.; and Nashef, Aws, 4,597,766, Cl. 623-13.000.
Swaniger, James R.; Steinert, Roger F.; and Puliafito, Carmen A., 4,597,649, Cl. 351-214.000.

American Medical Systems, Inc.: *See*—
Klatt, William M., 4,597,765, Cl. 623-11.000.

Amoco Corporation: *See*—
Weber, Kenneth E.; and Oberlin, Dirk, 4,598,105, Cl. 523-215.000.

Amon, Albert; and Weil, Roger M., to Sicpa Holding S.A. Desensitizing ink for wet offset printing. 4,597,793, Cl. 106-21.000.

Ampex Corporation: *See*—
Ryan, John O., 4,598,235, Cl. 315-370.000.

Amstutz, Jean-Pierre, to Bucher-Guyer AG. Method of an arrangement for preparation or conditioning of agricultural product. 4,597,250, Cl. 56-16.400.

Amtrol Inc.: *See*—
Kirk, Kenneth L., 4,597,559, Cl. 251-144.000.

Analytical Bio-Chemistry Laboratories Inc.: *See*—
Takagi, Hirofumi; Kunugita, Kiyohiko; Sawai, Hideki; and Kariyone, Kazuo, 4,598,066, Cl. 514-18.000.

Andersen & Associates, Inc.: *See*—
Steger, Arthur, 4,597,615, Cl. 312-201.000.

Anderson, Carl E. Heavy duty pump jack. 4,597,471, Cl. 182-136.000.

Anderson, Daniel F., to Texas Instruments Incorporated. Semiconductor memory with redundant column circuitry. 4,598,388, Cl. 365-200.000.

Anderson, David A. K.; Gilpin, James B.; and Kniffin, Melvin J., to Ford Aerospace & Communications Corporation. Method for making infrared detector dewar. 4,597,175, Cl. 29-827.000.

Anderson, David W.: *See*—
Burrage, Lawrence M.; Shaw, J. Howard; Marek, James R.; and Anderson, David W., 4,598,265, Cl. 337-219.000.

Anderson, Richard N., to Hunter Douglas Inc. Shipping clip for locking the slats on a venetian blind assembly against tilting. 4,597,427, Cl. 160-107.000.

Anderson, Thomas E. Use of foam in surface treatment of paper. 4,597,831, Cl. 162-135.000.

Andersson, Bengt O. K. Method and apparatus for gas-cooling. 4,597,268, Cl. 62-93.000.

Andersson, Per-Erik; Annergren, Goran E.; Hoglund, Hans E.; and Peterson, Per V., to Purac Aktiebolag. Method for anaerobic wastewater treatment. 4,597,872, Cl. 210-605.000.

Ando, Akio; Ochiai, Toshihiko; Nakanishi, Masae; Kawasaki, Shozo; and Nishida, Katsutoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of manufacturing radial flow turbine rotor. 4,597,926, Cl. 264-67.000.

Ando, Takayuki: *See*—
Yamamoto, Toshimasa; and Ando, Takayuki, 4,597,546, Cl. 242-107.40A.

Andreas Stihl: *See*—
Dolata, Hans; Meyle, Werner; Linke, Wilfried; Hagele, Hermann; and Buck, Ernst, 4,597,178, Cl. 30-138.000.

Andreasson, Bo C., to Aktiebolaget Electrolux. Ignition system with safety circuit. 4,597,373, Cl. 123-630.000.

Andreescu, George; Clark, Dennis E.; and Kerr, William J., to Beecham Group P.L.C. β-lactam antibiotics. 4,598,074, Cl. 514-196.000.

Andricos, Constantine, to ITT Corporation. Variable gain power amplifier. 4,598,252, Cl. 330-51.000.

Angelbeck, Rolf; Gesell, Reinhard; and Goessner, Matthias, to Dr. Ing. Rudolf Hell GmbH. Bearing device for threaded spindles. 4,597,678, Cl. 384-452.000.

Animotion Inc.: *See*—
Clarke, Ronald A. W., 4,597,691, Cl. 404-11.000.

Annergren, Goran E.: *See*—
Andersson, Per-Erik; Annergren, Goran E.; Hoglund, Hans E.; and Peterson, Per V., 4,597,872, Cl. 210-605.000.

Anschutz & Co. GmbH: *See*—
Lassig, Martin; and Bey, Ulf, 4,597,475, Cl. 188-378.000.

Antoku, Fujio: *See*—
Ishizumi, Kikuo; Antoku, Fujio; and Asami, Yukio, 4,598,078, Cl. 514-252.000.

Aoi, Tomio: *See*—
Nakajima, Tetsuo; and Aoi, Tomio, 4,598,370, Cl. 364-426.000.

Aoki, Tadamichi: *See*—
Ayusawa, Tadashi; Mori, Shoichiro; Aoki, Tadamichi; and Hamana, Ryozo, 4,598,159, Cl. 549-492.000.

Aoki, Takashi: *See*—
Sakurai, Yoshimi; Aoki, Takashi; and Nishikawa, Masao, 4,597,482, Cl. 192-0.052.

Aoki, Yoshikazu: *See*—
Kamata, Masami; Tabushi, Iwao; Morimoto, Saichi; Asaeda, Takashi; and Aoki, Yoshikazu, 4,597,798, Cl. 106-203.000.

Aoki, Yuji: *See*—
Ikuma, Sadao; Aoki, Yuji; and Watanabe, Noboru, 4,598,126, Cl. 525-194.000.

Aoyagi, Keizo: *See*—
Kinjo, Morishige; Kihara, Jyun-ichi; and Aoyagi, Keizo, 4,598,362, Cl. 364-200.000.

Aoyama, Takeo; Magara, Syoji; Yokoyama, Shigeki; Kamei, Tadashi; and Uehara, Mikio, to Nippon Petrochemicals Company, Limited. Method for producing laminated sheets or films. 4,597,818, Cl. 156-308.200.

Aoyama, Takuo: *See*—
Fujii, Setsuro; Sato, Takuo; Kawamura, Hiroyuki; Yaegashi, Takashi; Kurumi, Masateru; and Aoyama, Takuo, 4,598,077, Cl. 514-233.000.

Apffel, Fred P., to Flexivol, Inc. Process for recovering ethane, propane and heavier hydrocarbons from a natural gas stream. 4,597,788, Cl. 62-26.000.

Aplin & Barrett, Ltd.: *See*—
Taylor, Stephen L., 4,597,972, Cl. 426-36.000.
Ziemelis, Maris J.; and Roth, Charles A., 4,597,964, Cl. 424-70.000.

April, Gary C.; and Nayak, Ramkrishna G., to University of Alabama, The. Method and pulping composition for the selective delignification of lignocellulosic materials with an aqueous amine-alcohol mixture in the presence of a catalyst. 4,597,830, Cl. 162-32.000.

Apsimon, John W.: *See*—
Guiver, Michael D.; Kutowy, Oleh; and Apsimon, John W., 4,598,137, Cl. 528-173.000.

Apsley Metals Limited: *See*—
McGlashen, James N., 4,597,728, Cl. 425-23.000.

Arai, Tohru: *See*—
Tachikawa, Hideo; Suzuki, Takatoshi; Fujita, Hironori; and Arai, Tohru, 4,597,808, Cl. 148-20.300.

Arai, Yasunori, to Asahi Kogaku Kogyo Kabushiki Kaisha. Variable-power copying lens. 4,597,641, Cl. 350-425.000.

Araki, Shigeyuki: *See*—
Suzaki, Masayuki; Nishiwaki, Shoji; Hayashima, Toshitaka; Araki, Shigeyuki; and Momose, Masanori, 4,598,301, Cl. 346-76.0PH.

Archer, Wesley L.: *See*—
Dallessandro, Susan M.; Archer, Wesley L.; and Krupp, Stephen P., 4,597,890, Cl. 252-153.000.

Archery Designs, Inc.: *See*—
Peck, Paul L., 4,597,473, Cl. 182-187.000.

Arita, Masafumi: *See*—
Tahara, Tetsuya; Arita, Masafumi; and Kuroda, Tsuyoshi, 4,598,093, Cl. 514-538.000.

Arkenbout, Gerardus J.: *See*—
Thijssen, Henricus A. C.; and Arkenbout, Gerardus J., 4,597,768, Cl. 23-299.000.

Armour Pharmaceutical Co.: *See*—
Orlowski, Ronald C.; and Seyler, Jay K., 4,597,900, Cl. 530-307.000.

Armstrong World Industries, Inc.: *See*—
Christie, Peter A.; and Hoyle, Charles E., 4,598,009, Cl. 428-172.000.
Ollinger, James C.; and Shaub, Melvin H., 4,598,010, Cl. 428-172.000.

Arques, Marc, to Thomson-CSF. Solid state photosensitive device. 4,598,320, Cl. 358-213.000.

Asaeda, Takashi: *See*—
Kamata, Masami; Tabushi, Iwao; Morimoto, Saichi; Asaeda, Takashi; and Aoki, Yoshikazu, 4,597,798, Cl. 106-203.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,597,913, Cl. 558-436.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Arai, Yasunori, 4,597,641, Cl. 350-425.000.

Asai, Yasuhiro: *See*—
Hamada, Masami; Tanaka, Kiyokazu; Kikuchi, Takeshi; Asai, Yasuhiro; Hayashi, Chihiro; and Ohtake, Fumio, 4,597,278, Cl. 72-187.000.

Asakawa, Terushige: *See*—
Morita, Koyo; Nomura, Keizo; Nishizuka, Hiroshi; Hoshi, Tai; Tamiya, Yoichiro; and Asakawa, Terushige, 4,598,197, Cl. 250-205.000.

Asami, Yukio: *See*—
Ishizumi, Kikuo; Antoku, Fujio; and Asami, Yukio, 4,598,078, Cl. 514-252.000.

AT&T Bell Laboratories: *See*—
Boddie, James R.; Gadenz, Renato N.; and Thompson, John S., 4,598,358, Cl. 364-200.000.
Capasso, Federico; Focht, Marlin W.; Macrander, Albert T.; and Schwartz, Bertram, 4,597,165, Cl. 29-576.00B.
Chandross, Edwin A.; Dean, Robert E.; and Smolinsky, Gerald, 4,597,985, Cl. 427-39.000.
Chemla, Daniel S.; Miller, David A. B.; and Smith, Peter W., 4,597,638, Cl. 350-354.000.
Clark, Larry L.; DeArdo, Carmen E.; and Shaffer, Barry A., 4,598,363, Cl. 364-200.000.
Fischer, Frederick H.; Murphy, Edmond J.; and Rice, Trudie C., 4,598,039, Cl. 430-323.000.
Hoshen, Joseph, 4,598,285, Cl. 340-825.500.
Krumreich, Charles L., 4,597,623, Cl. 339-97.00P.

AT&T Technologies, Inc.: *See*—
Schoenthaler, David; and Wojcik, Thaddeus, 4,597,420, Cl. 141-2.000.

Atherton, Larry S., to Honeywell Inc. Video level control for CCD camera. 4,598,322, Cl. 358-213.000.

Athey Products Corporation: *See*—
Kovats, Lawrence H. G., 4,597,710, Cl. 414-409.000.

Atlantic Richfield Company: *See*—
Hutchinson, Thomas S., 4,597,444, Cl. 166-302.000.
Isaacs, Bruce H., 4,598,057, Cl. 502-24.000.
Josefowicz, Jack Y., 4,597,839, Cl. 204-67.000.
Norrgran, Daniel A.; and Davis, William B., 4,597,857, Cl. 209-166.000.

Atochem: *See*—
Neel, Henri; and Delannoy, Francis, 4,597,833, Cl. 203-49.000.

Attar, Amir. Coal demineralization and depyritization process. 4,597,769, Cl. 44-1.0SR.

Aubex Corporation: *See*—
Kurihara, Norigi; and Sakuda, Ryutaro, 4,597,932, Cl. 264-145.000.

Automation Industries, Inc.: *See*—
Burns, Edgar, 4,597,621, Cl. 339-90.00R.

Autotrol Corporation: *See*—
Goudy, Paul R., Jr.; Doolittle, William P.; Jenkins, Thomas E.; Beemster, Bernard J.; Roos, William N.; and Collins, Patrick V., 4,597,530, Cl. 239-452.000.

AVI Alpenlandische Veredelungs-Industrie Gesellschaft m.b.H.: *See*—
Matz, Klaus; Ritter, Gerhard; Ritter, Klaus; and Pollhammer, Edgar, 4,597,239, Cl. 52-644.000.

Awane, Misao; Hara, Seiji; and Kobayashi, Satoshi, to Sanyo Electric Co., Ltd.; and Tokyo Sanyo Electric Co., Ltd. Control system of an automatic vending machine. 4,598,379, Cl. 364-479.000.

Awerbuch, Leon: *See*—
Rogers, Alfred N.; and Awerbuch, Leon, 4,597,950, Cl. 422-252.000.

Axel Johnson Engineering AB: *See*—
Hakansson, Sven, 4,597,869, Cl. 210-232.000.

Ayabe, Tadaaki: *See*—
Kitayama, Yukio; Ochiai, Izumi; Nozawa, Yoshio; Miyagi, Masahiro; Ayabe, Tadaaki; and Uehara, Katsuharu, 4,597,171, Cl. 29-727.000.

Ayusawa, Tadashi; Mori, Shoichiro; Aoki, Tadamichi; and Hamana, Ryozo, to Mitsubishi Petrochemical Co., Ltd. Process for producing furfurylamine and/or tetrahydrofurfurylamine. 4,598,159, Cl. 549-492.000.

B. F. Goodrich Company, The: *See*—
Blayne, Jerome J., 4,597,929, Cl. 264-102.000.

Babano, Sotoaki, to NEC Corporation. Circuit arrangement comprising a voltage-controlled oscillator operable with different sensitivities. 4,598,258, Cl. 331-14.000.

Backx, Leo J. J.: *See*—
Heeres, Jan; Backx, Leo J. J.; and Mostmans, Joseph A., 4,598,085, Cl. 514-383.000.

Bacon, Jeffery E.; Craig, James E.; and Pedersen, Mark K., to Robbins & Craig Welding & Mfg. Co. Continuous contact plating apparatus. 4,597,845, Cl. 204-206.000.

Badische Corporation: *See*—
Smith, Glendon C., 4,597,297, Cl. 73-862.480.

Bagley, Weldon D.: *See*—
Daudet, Howard C.; and Bagley, Weldon D., 4,597,362, Cl. 122-4.00D.

Bailey, Denis M., to Sterling Drug Inc. Antimicrobial (N-1-octyl-4(1H)-pyridinylidine)octanamine and acid addition salts thereof and methods of use and compositions thereof. 4,598,082, Cl. 514-352.000.

Baisch, Herbert: *See*—
Handler, Milton E.; Sylvan, Richard; and Baisch, Herbert, 4,597,122, Cl. 5-503.000.

Baldauf, Lawrence M.; Girvan, Edward J.; Overfield, Richard B.; and Roberts, Gilbert C., to International Business Machines Corporation. Fabricating contacts for flexible module carriers. 4,597,177, Cl. 29-878.000.

Baldus, Heinz-Dieter: *See*—
Heinemann, Otto; Baldus, Heinz-Dieter; Supp, Armin; Nanz, Hans; Thieme, Helmut; and Rasch, Heinz, 4,597,867, Cl. 210-218.000.

Ballato, Arthur, to United States of America, Army. Surface acoustic wave device for sensing the presence of chemical agents. 4,598,224, Cl. 310-313.00R.

Ballato, Arthur, to United States of America, Army. Microwave saw monochromator. 4,598,261, Cl. 333-195.000.

Balleys, Francois, to Charmilles Technologies, S.A. Method and apparatus for machining a workpiece in a travelling wire EDM apparatus. 4,598,190, Cl. 219-69.00W.

Balsley, Rollin B.; and Morrill, Daniel J., to Williams International Corporation. Oxygen starting assist system. 4,597,260, Cl. 60-39.827.

Bammel, Brian D., to OMI International Corporation. Additive agent for zinc alloy electrolyte and process. 4,597,838, Cl. 204-44.200.

Banner Engineering Corp.: *See*—
Fayfield, Robert W., 4,598,198, Cl. 250-205.000.

Baran, Werner: *See*—
Kukuck, Karl-Heinz; and Baran, Werner, 4,597,860, Cl. 209-223.00A.

Barber, Norman R.: *See*—
Mitchell, Keith J.; Barber, Norman R.; and Ward, Michael, 4,597,689, Cl. 403-322.000.

Barch, Daniel R.: *See*—
Ramser, Robert A.; Barch, Daniel R.; Buchovecky, Kalman E.; and Kuchera, Ray A., 4,597,919, Cl. 264-12.000.

Bardon, Anne M.: *See*—
Tarpley, Gerald W., Jr.; and Bardon, Anne M., 4,597,547, Cl. 242-191.000.

Barker, George E.: *See*—
Forster, Denis; Schaefer, George F.; and Barker, George E., 4,598,162, Cl. 568-448.000.

Barlow, Carl S.; and Jacobson, Alfred G., to Barlow, Inc. Ankle support including a heel lock and a crossover strap. 4,597,395, Cl. 128-80.00H.

Barlow, Inc.: *See*—
Barlow, Carl S.; and Jacobson, Alfred G., 4,597,395, Cl. 128-80.00H.

Barnard, Richard. Electric vehicle using the vehicle's kinetic and mechanical power to regenerate it's energy storage device. 4,597,463, Cl. 180-165.000.

Barnett, John D.: *See*—
Harbour, John; and Barnett, John D., 4,597,154, Cl. 29-525.000.

Barnhart, Robert V., to GTE Products Corporation. Scrap-less taping system for IC lead-frames. 4,597,816, Cl. 156-263.000.

Barr, Arthur. Sustained release breath freshener, mouth and palate coolant wafer composition and method of use. 4,597,959, Cl. 424-19.000.

Barraud, Andre ; Leloup, Jean; and Ruaudel, Annie, to Commissariat a l'Energie Atomique. Material containing microaggregates of metals, inorganic compounds or organometallic compounds, more particularly usable in heterogeneous catalysis and its production process. 4,598,056, Cl. 502-4.000.

Barry Wright Corporation: *See*—
Racca, Romulus, 4,597,567, Cl. 267-140.200.

Barth, Hubert; Fritschi, Edgar; Ganser, Volker; Hartenstein, Johannes; Herrmann, Manfred; and Satzinger, Gerhard, to Warner-Lambert Company. 2-pyrrolin-3-carbonitril-derivatives, pharmaceutical compositions containing them and their anti-inflammatory and ulcer protective activity. 4,598,076, Cl. 514-230.000.

Bartholomay, William G.: *See*—
Upp, Daniel C.; and Bartholomay, William G., 4,598,396, Cl. 370-27.000.

Bartlett, Philip L., to Du Pont de Nemours, E. I., and Company. Aerosol corrosion inhibitors. 4,597,895, Cl. 252-392.000.

Bartolini, Mauro, to Agrimac di Bartolini Mauro. Bale handling and hay distributing apparatus. 4,597,703, Cl. 414-24.600.

Bascou, Jacques, to Regie Nationale des Usines Renault. Device for electrical opening and closing of a vehicle lid equipped with a lock of the cocking type. 4,597,598, Cl. 292-68.000.

BASF Aktiengellschaft: *See*—
Horn, Peter; Bunsch, Hellmut; Gehm, Robert; and Marx, Matthias, 4,598,125, Cl. 525-183.000.

BASF Aktiengesellschaft: *See*—
Eisert, Manfred; and Grychtol, Klaus, 4,597,912, Cl. 558-403.000.
Frank, Gerhard; Neubauer, Gerald; Duffner, Paul; and Wilfinger, Hans J., 4,598,058, Cl. 502-183.000.
Merger, Franz; and Schwarz, Wolfgang, 4,597,907, Cl. 260-404.000.
Roller, Hermann; Hack, Joachim; Woweries, Uwe; Lehner, August; Grau, Werner; Nagel, Peter; and Falk, Roland, 4,597,990, Cl. 427-130.000.
Zeitler, Gerhard; Werner, Frank; Bittner, Gerhard; Baumann, Karl-Heinz; Roeber, Artur; Metzinger, Lothar; Ohlinger, Rainer; and Zettler, Hans D., 4,597,927, Cl. 264-85.000.

Bateman Engineering (International) Limited: *See*—
Siddall, George B., 4,597,791, Cl. 75-118.00R.

Bath, David E., to Rockwell International Corporation. Multichannel multisite signal protection channel switching apparatus. 4,598,399, Cl. 370-55.000.

Battelle Development Corporation: *See*—
Schaer, Glenn R.; and Preston, Joseph R., 4,597,836, Cl. 204-4.000.

Bauch, Ernst; and Vehling, Ernst, to Neumuenstersche Maschinen- und Apparatebau GmbH. Apparatus for crimping synthetic plastic cables. 4,597,142, Cl. 28-269.000.

Baugh, Benton F., to Smith International, Inc. Subsea wellhead system. 4,597,448, Cl. 166-348.000.

Baumann, Karl-Heinz: *See*—
Zeitler, Gerhard; Werner, Frank; Bittner, Gerhard; Baumann, Karl-Heinz; Roeber, Artur; Metzinger, Lothar; Ohlinger, Rainer; and Zettler, Hans D., 4,597,927, Cl. 264-85.000.

Bautex Adolf Stover Sohne KC: *See*—
Driessen, Edgar, 4,597,429, Cl. 160-236.000.

Baxter Travenol Laboratories, Inc.: *See*—
Aalto, William R.; and Ruschke, Rick R., 4,597,758, Cl. 604-256.000.

Bayer Aktiengellschaft: *See*—
Thoma, Wilhelm; Langel, Rolf; and Schroer, Walter, 4,598,120, Cl. 524-591.000.

Bayer Aktiengesellschaft: *See*—
Heitz, Walter; and Strohriegl, Peter, 4,598,143, Cl. 528-336.000.
Keggenhoff, Berthold; Mahlmann, Enno; Eifler, Willi; and Ellendt, Gunther, 4,597,909, Cl. 560-347.000.
Konig, Klaus; and Heitkamper, Peter, 4,597,910, Cl. 560-359.000.
Kuhlthau, Hans-Peter; and Harnisch, Horst, 4,598,151, Cl. 546-167.000.
Ostlinning, Edgar; Idel, Karsten; Eisermann, Wolfgang M.; and Freitag, Dieter, 4,598,144, Cl. 528-388.000.

Bayer, Thomas; Hinkel, Holger; Kleischmann, Kurt; Kuenzel, Ulrich; and Schafer, Rolf, to International Business Machines Corporation. Composite magnetic disk with Si and SiC substrate. 4,598,017, Cl. 428-336.000.

BBC Brown, Boveri & Company, Ltd.: *See*—
Gaia, Franco, 4,597,877, Cl. 210-750.000.
Killer, Eric; and Scherer, Gunther, 4,597,846, Cl. 204-290.00F.

Beachey, Edwin H., to University of Tennessee Research Corp., The. Synthetic polypeptide fragments. 4,597,967, Cl. 424-88.000.

Beardmore, Geoffrey; and Neville, Antony, to Smiths Industries Public Limited Company. Arrangements and methods of mounting a unit in a casing. 4,597,300, Cl. 74-5.00R.

Bechtel International Corporation: *See*—
Rogers, Alfred N.; and Awerbuch, Leon, 4,597,950, Cl. 422-252.000.
Wallace, Norman R., 4,597,595, Cl. 285-119.000.

Beck, Jeffrey L., to Conoco Inc. Adjustable vortex classifier. 4,597,859, Cl. 209-211.000.

Beck, Manfred, to Bunawerke Huls GmbH. Catalyst system and the use thereof for the production of EPDM rubber. 4,598,132, Cl. 526-142.000.

Becker, James; and Mayer, Andrew S. Free-standing rolling book for children. 4,597,743, Cl. 446-71.000.

Beech, Robert A. Machine for cleaning a plurality of floor maintenance pads. 4,597,126, Cl. 15-3.000.

Beecham Group P.L.C.: *See*—
Andreescu, George; Clark, Dennis E.; and Kerr, William J., 4,598,074, Cl. 514-196.000.

Beehler, James O.: *See*—
Peekema, Thomas E.; and Beehler, James O., 4,598,303, Cl. 346-140.00R.

Beemster, Bernard J.: *See*—
Goudy, Paul R., Jr.; Doolittle, William P.; Jenkins, Thomas E.; Beemster, Bernard J.; Roos, William N.; and Collins, Patrick V., 4,597,530, Cl. 239-452.000.

Behn, Reinhard; and Solar, Josef, to Siemens Aktiengesellschaft. Impregnated wound capacitor. 4,598,335, Cl. 361-314.000.

Behringwerke Aktiengesellschaft: *See*—
Falke, Jurgen, 4,597,899, Cl. 530-383.000.

Bell, William R.: *See*—
Walters, D. F.; Brunson, David T.; and Bell, William R., 4,597,455, Cl. 175-228.000.

Bellamy, Francois: *See*—
Samreth, Soth; Bellamy, Francois; and Chazan, Jean-Bernard, 4,598,068, Cl. 514-25.000.

Bellina, Joseph H. Laser surgical operating method and apparatus. 4,598,311, Cl. 358-93.000.

Bender, Heinz: *See*—
Beyerle, Rudi; Bender, Heinz; Schindler, Ursula; Nitz, Rolf-Eberhard; and Martorana, Piero A., 4,598,079, Cl. 514-252.000.

Benedict, George J.: *See*—
Reed, Edward D., Jr.; and Benedict, George J., 4,598,405, Cl. 372-12.000.

Beneditz, Bruce D.: *See*—
Shepler, John E.; Rinker, Douglas A.; Beneditz, Bruce D.; Vicari, John J.; and Faulkner, Dennis T., 4,598,355, Cl. 364-184.000.

Beneke, Herbert: *See*—
Lucke, Wolfgang; Beneke, Herbert; and Staglich, Peter, 4,598,138, Cl. 528-205.000.

Benjamin, John L.; and Van Dell, William R., to General Electric Company. Method for making silicon wafers. 4,597,822, Cl. 156-612.000.

Bennett, Donald W. Swivel bar apparatus for use with steel and other types of sucker rods. 4,597,438, Cl. 166-105.000.

Benoit, Gordon, to Mobil Oil Corporation. Horseshoe folded and center unwound plastic bags. 4,597,494, Cl. 206-390.000.

Benson, Ryan H. Snap together badge and clip. 4,597,206, Cl. 40-1.500.

Berens, Ulrich, to Ingenieurburo Leuenberger AG. Essentially neutral rust converter and rust preventive. 4,598,114, Cl. 524-345.000.

Berg, Lloyd; and Yeh, An-I. Separation of methyl acetate from methanol by extractive distillation. 4,597,834, Cl. 203-51.000.

Bergler, Otto, to Black & Decker Overseas AG. Planing tool having a quickly releasable rotary planer head. 4,597,181, Cl. 30-475.000.

Bergloff, Raymond A.; and Hollis, James T., to HR Textron Inc. Shock absorbing struts for aircraft landing gear. 4,597,548, Cl. 244-104.0FP.

Bergquist, Bertil R.: *See*—
Crosby, Kennith D.; Tuten, William J.; Black, Harold W.; and Bergquist, Bertil R., 4,597,487, Cl. 194-209.000.

Berkovich, Semyon; Wilson, Colleen R.; and Walter, Chris J., to Allied Corporation. On-the-fly data compression system. 4,598,411, Cl. 375-27.000.

Bernardson, Peter S., to GTE Communications Systems Corporation. Modulo adder. 4,598,266, Cl. 340-347.0DD.

Bernhard Forster GmbH: *See*—
Sander, Gunter; and Forster, Rolf, 4,597,738, Cl. 433-7.000.

Berning, Steven K.: *See*—
Droppleman, J. Patrick; Olson, Iner C.; Phillip, Jeffrey S.; and Berning, Steven K., 4,597,137, Cl. 24-33.00P.

Berry, Ira R.; Shah, Dilip; and Borkan, Lionel, to Pharmacaps, Inc. Encapsulated foaming bath composition. 4,597,885, Cl. 252-93.000.

Bertaud, Yves: *See*—
Cohen, Joseph; Gurtner, Bernard; and Bertaud, Yves, 4,597,840, Cl. 204-67.000.

Bertignoll, Friedrich: *See*—
Ryan, Desmond J.; and Bertignoll, Friedrich, 4,598,176, Cl. 179-103.000.

Beta B.V.: *See*—
Bruin, Adrianus M. J., 4,597,409, Cl. 137-461.000.

Beuscher, Clinton J., to Galileo Electro-Optics Corp. Insulating high temperature wire. 4,598,018, Cl. 428-389.000.

Bevilacqua, Bruce W.: *See*—
Brill, Bernard A., III; Junker, Warren R.; White, John K.; Rana, Iftikhar A.; Bevilacqua, Bruce W.; Cooper, Frank W., Jr.; and Taszarek, Bruce J., 4,597,294, Cl. 73-623.000.

Bey, Ulf: *See*—
Lassig, Martin; and Bey, Ulf, 4,597,475, Cl. 188-378.000.

Beyer, Horst: *See*—
Neuhauser, Hans J.; Buran, Ulrich; Fischer, Manfred; and Beyer, Horst, 4,597,939, Cl. 420-429.000.

Beyerle, Rudi; Bender, Heinz; Schindler, Ursula; Nitz, Rolf-Eberhard; and Martorana, Piero A., to Cassella Aktiengesellschaft. 2-(aryl substitued)piperazinones and nootropic compositions based thereon. 4,598,079, Cl. 514-252.000.

Bhattacharya, Bani K.: *See*—
Lal, Bansi; Dornauer, Horst; Bhattacharya, Bani K.; Dohadwalla, Alihussein N.; and de Souza, Noel J., 4,598,148, Cl. 544-252.000.

BICC Public Limited Company: *See*—
Seddon, Alan E.; and Littler, Joseph, 4,598,180, Cl. 191-35.000.

Bifok AB: *See*—
Ruzicka, Jaromir; and Hansen, Elo H., 4,597,298, Cl. 73-863.710.

Bigg, Dennis; and Menin, Jacques. α_2 antagonistic 2-(4,5-dihydro-2-1H-imidazolyl)-2,3-dihydro-1H-indoles. 4,598,086, Cl. 514-402.000.

Biggs, Kenneth L. Bonding method and means. 4,597,520, Cl. 228-111.000.

Billimoria, Rustom M.; and Tao, Frank F., to Exxon Research and Engineering Co. Coking and gasification process. 4,597,775, Cl. 48-197.00R.

Biomeasure, Inc.: *See*—
Kim, Sun H., 4,598,067, Cl. 514-19.000.

Birkhauser, Robert R., III, to A.G.S., Inc. Windshield repair kit. 4,597,727, Cl. 425-12.000.

Birrittella, Mark S.: *See*—
Marley, Robert R.; and Birrittella, Mark S., 4,598,213, Cl. 307-270.000.

Bisbing, Robert H., to Southco, Inc. Blind latch. 4,597,599, Cl. 292-174.000.

Biscomb, Lloyd I. Water current motor. 4,598,210, Cl. 290-43.000.

Bittner, Gerhard: *See*—
Zeitler, Gerhard; Werner, Frank; Bittner, Gerhard; Baumann, Karl-Heinz; Roeber, Artur; Metzinger, Lothar; Ohlinger, Rainer; and Zettler, Hans D., 4,597,927, Cl. 264-85.000.

Bjorshol, Kolbjorn. Fish hook protector. 4,597,216, Cl. 43-43.200.

Black, Bruce. Ossicular replacement prosthesis. 4,597,764, Cl. 623-10.000.

Black & Decker Inc.: *See*—
O'Brien, Lawrence B.; and Messick, Walker A., 4,597,684, Cl. 401-197.000.

Black & Decker Overseas AG: *See*—
Bergler, Otto, 4,597,181, Cl. 30-475.000.

Black, Harold W.: *See*—
Crosby, Kennith D.; Tuten, William J.; Black, Harold W.; and Bergquist, Bertil R., 4,597,487, Cl. 194-209.000.

Blayne, Jerome J., to B. F. Goodrich Company, The. Method for ventless tire molding and tire resulting therefrom. 4,597,929, Cl. 264-102.000.

Bloor, Trevor J.; and Walton, Lawrence J. Connection assemblies. 4,597,597, Cl. 285-196.000.

Blumer, Leo; and Lenzer, Xaver, to Karl Mengele & Sohne GmbH & Co. Forage or picking harvester unit. 4,597,253, Cl. 56-13.400.

Bock, Ortwin: *See*—
Schneider, Michael; Kochloefl, Karel; and Bock, Ortwin, 4,598,061, Cl. 502-303.000.
Schneider, Michael; Pohl, Joachim; Kochloefl, Karel; and Bock, Ortwin, 4,598,062, Cl. 502-306.000.

Bocker, Jurgen; and Wallow, Peter, to Rheinmetall G.m.b.H. Two-part armor-piercing projectile. 4,597,333, Cl. 102-518.000.

Bodde, Gerald J. Submersible fishing light. 4,598,346, Cl. 362-267.000.

Boddie, James R.; Gadenz, Renato N.; and Thompson, John S., to AT&T Bell Laboratories. Pipelined digital signal processor using a common data and control bus. 4,598,358, Cl. 364-200.000.

Bodnar, Michael L., to Easco Corporation. Ratcheting tool with improved support for driven shank. 4,597,478, Cl. 192-43.100.

Bohan, John E., Jr.: *See*—
Adams, John T.; and Bohan, John E., Jr., 4,598,333, Cl. 361-286.000.

Bolinder, Boo; and Schmid, Hermann, to Aktiebolaget Bofors. Method of producing progressively burning artillery propellant powder and agent adapted thereto. 4,597,994, Cl. 427-213.000.

Bollinger, Lawrence R.; and Crawford, Donald C., to United States of America, Energy. Multi-function magnetic jack control drive mechanism. 4,597,934, Cl. 376-235.000.

Bolt Technology Corporation: *See*—
Chelminski, Paul, 4,597,464, Cl. 181-114.000.

Boothroyd, Donald C.; and Norman, Robert W., Jr., to Honeywell Information Systems Inc. Apparatus for forward or reverse reading of multiple variable length operands. 4,598,359, Cl. 364-200.000.

Boothroyd, Donald C.; Norman, Robert W., Jr.; and Keller, Howard J., to Honeywell Information Systems Inc. Pipelined decimal character execution unit. 4,598,365, Cl. 364-200.000.

Borkan, Lionel: *See*—
Berry, Ira R.; Shah, Dilip; and Borkan, Lionel, 4,597,885, Cl. 252-93.000.

Borman, Willem F. H.; and Campbell, Richard W., to General Electric Company. Block carbonate-carboxylate copolyesters and method for their preparation. 4,598,129, Cl. 525-439.000.

Bostitch Division of Textron Inc.: *See*—
Paul, Richard N., 4,597,518, Cl. 227-128.000.

Bottcher, Regina; Juhnke, Hubert; Kulawick, Gabriele; Zehle, Gunter; and Zosche, Helmut, to Institut fuer Getreideverarbeitung im VEB

Kombinat Nahrungsmittel und Kaffee. Procedure for the production of food foams. 4,597,980, Cl. 426-568.000.

Bottom, Carey B.; Gilmore, Jane F.; and Martin, John L., Jr., to Drackett Company, The. Toilet cleaning article and method for codispensing disinfectant and dye having resistance to spectral degradation. 4,597,941, Cl. 422-37.000.

Bouchard, Andre C., to GTE Products Corporation. Compact fluorescent lamp having thermally actuable means. 4,598,230, Cl. 313-493.000.

Bouma, Juliette A. Infant cover with receiving pouch. 4,597,121, Cl. 5-494.000.

Bourdet, Dominique; and Whittle, Timothy, to Schlumberger Technology Corporation. Method for determining the characteristics of a fluid-producing underground formation. 4,597,290, Cl. 73-155.000.

Bourdon, Yves: *See—*
Deroche, Raymond-Yves; Bourdon, Yves; and Faessel, Andre 4,597,283, Cl. 72-378.000.

Bourgain, Olivier: *See—*
Selignan, Olivier; Bourgain, Olivier; and Martin, Jean-Marie, 4,597,490, Cl. 198-468.500.

Bourgeois, R.: *See—*
Bourgeois, Raymond, 4,597,172, Cl. 29-736.000.

Bourgeois, Raymond, to Bourgeois, R. Apparatus for manufacturing annular piles of magnetic plates for electrical machines. 4,597,172, Cl. 29-736.000.

Bourrie, Andre: *See—*
Bourrie, Andre R. J.; and Maroselli, Jacques L. R., 4,597,220, Cl. 47-27.000.

Bourrie, Andre R. J.; and Maroselli, Jacques L. R., to Bourrie, Andre; and Maroselli, Jacques. Closed enclosure used as greenhouse, cultivation frame or fish pond and improving exploitation conditions. 4,597,220, Cl. 47-27.000.

Bowden, Donald F., Jr., to Sperry Corporation. Method of forming roll bales. 4,597,249, Cl. 56-1.000.

Bowden, Donald F., Jr., to Sperry Corporation. Continuous roll baler. 4,597,254, Cl. 56-341.000.

Bowman, Jeffery B. High strength porous polytetrafluoroethylene product having a coarse microstructure. 4,598,011, Cl. 428-221.000.

Boyd, Dana M.; Catchman, Vernon C.; and Broderick, Kevin, to Mobil Oil Corporation. Insertion of draw tape strips in draw tape bag manufacture. 4,597,750, Cl. 493-346.000.

Boys, Donald R., to IODEP, Inc. Non-magnetic sputtering target. 4,597,847, Cl. 204-298.000.

BP Nutrition (UK) Limited: *See—*
Perry, Frederick G.; and Fisher, John, 4,598,097, Cl. 514-738.000.

Brabant, Bette-Jean: *See—*
Jones, Charles E.; and Brabant, Bette-Jean, 4,597,889, Cl. 252-135.000.

Brackbill, Warren H.: *See—*
Linde, Gilbert W.; Stauffer, Norman M.; and Brackbill, Warren H., 4,597,532, Cl. 239-675.000.

Brackhahn, Virgil D.; and Cook, Gary W., to Storekraft Manufacturing Co. Display case lighting system. 4,598,341, Cl. 362-125.000.

Bradford, Michael P., to United States of America, Army. Electric chip detector. 4,598,280, Cl. 340-631.000.

Brainard, Edward C., II, to ENDECO-Environmental Devices Corp. Accumulator. 4,597,351, Cl. 114-230.000.

Brand, Gerd; and Moring, Wilhelm, to U.S. Philips Corporation. Circuit arrangement for obtaining a phase-sensitive control quantity, in particular in a color television receiver. 4,598,310, Cl. 358-19.000.

Brandel, Klaus: *See—*
Kochy, Fritz; Brandel, Klaus; Hullmann, Horst; Neumann, Bernhard; and Helmsing, Gerhard, 4,597,461, Cl. 180-90.000.

Brandstetter, Robert W.; Lynn, Otto F.; Reich, Abraham; and Waido, Richard P., to Grumman Corporation. Self-derived reference beam holography using a dove prism. 4,597,630, Cl. 350-3.830.

Brandt, David S.; and Costello, Samuel J., to Allied Corporation. Process for forming articles by heading. 4,597,281, Cl. 72-318.000.

Bras, Serge M. Detector for localizing an electromagnetic radiation and a device for processing signals supplied by said detector. 4,598,204, Cl. 250-374.000.

Braun, Helmut, to Luk Lamellen und Kupplungsbau GmbH. Friction clutch. 4,597,485, Cl. 192-70.270.

Braxton, James S. Hollow wall construction. 4,597,236, Cl. 52-564.000.

Brennecke, James H.; and Mace, Robert E., to Standard Havens, Inc. Tensioning device for bag filters. 4,597,783, Cl. 55-378.000.

Breslin, Daniel V. Lock inhibitor for toggle switch actuator. 4,598,182, Cl. 200-43.110.

Bridgestone Tire Company Limited: *See—*
Ichikawa, Seizo, 4,597,157, Cl. 29-564.800.

Bright, Randall P.: *See—*
Miller, Richard S.; Bright, Randall P.; Vargo, Richard D.; and Dreyfuss, Patricia M., 4,598,012, Cl. 428-228.000.

Brill, Bernard A., III; Junker, Warren R.; White, John K.; Rana, Iftikhar A.; Bevilacqua, Bruce W.; Cooper, Frank W., Jr.; and Taszarek, Bruce J., to Westinghouse Electric Corp. Ultrasonic nondestructive tubing inspection system. 4,597,294, Cl. 73-623.000.

Brill, Bertrand A.: *See—*
Luccio, Alfredo U.; and Brill, Bertrand A., 4,598,415, Cl. 378-119.000.

Briscoe, Terry L.; and VanRaden, Rebecca A. H., to Esco Corporation. Shovel dipper bail assembly. 4,597,713, Cl. 414-690.000.

Brisson, Alfred G.: *See—*
Koziol, Jeffrey; Nowacki, Christopher; and Brisson, Alfred G., 4,597,388, Cl. 128-303.100.
Nowacki, Christopher; and Brisson, Alfred G., 4,598,279, Cl. 340-626.000.

Bristol-Myers Company: *See—*
Matson, James A.; Myllymaki, Robert W.; Doyle, Terrence W.; and Bush, James A., 4,598,145, Cl. 536-1.100.

Britax-Kolb GmbH & Co.: *See—*
Burghardt, Wilfried, 4,597,545, Cl. 242-107.200.
Burghardt, Wilfried; Nilsson, Karl E.; and Ernst, Hans-Hellmut, 4,597,586, Cl. 280-806.000.

British Petroleum Company p.l.c., The: *See—*
Byford, Derek C.; Green, Peter J.; and Lewis, Alun, 4,597,893, Cl. 252-354.000.

British Telecommunications: *See—*
Mallinson, Stephen R., 4,597,632, Cl. 350-96.210.

Broderick, Kevin: *See—*
Boyd, Dana M.; Catchman, Vernon C.; and Broderick, Kevin, 4,597,750, Cl. 493-346.000.

Broding, Robert A., to Standard Oil Company (Indiana). Methods and apparatus for measuring a length of cable suspending a well logging tool in a borehole. 4,597,183, Cl. 33-125.00W.

Broome, Barry G.: *See—*
Feldon, Steven E.; Broome, Barry G.; and Wallace, David A., 4,597,648, Cl. 351-212.000.

Brose Fahrzeugteile GmbH & Co. KG: *See—*
Forkel, Michael; Dallwig, Claus; and Volk, Hans-Joachim, 4,597,607, Cl. 297-468.000.

Brosius, Klaus: *See—*
Muller, Helmut; and Brosius, Klaus, 4,597,481, Cl. 192-58.00A.

Browen, Rodney: *See—*
Groves, William A.; Snook, Matthew L.; and Browen, Rodney, 4,598,245, Cl. 324-73.0JR.

Brown, Ben S. Method and apparatus for separating hulls and debris from plant products. 4,597,977, Cl. 426-482.000.

Brown, Boveri & Cie Aktiengesellschaft: *See—*
Ziegenbein, Botho, 4,598,005, Cl. 428-69.000.

Brown, Dennis N., to Northwest Podiatric Laboratories, Inc. Orthotic insert and method or making of the same. 4,597,196, Cl. 36-44.000.

Brown, Eugene N., to Refractory Anchors, Inc. Clip for insulation hanger. 4,597,702, Cl. 411-529.000.

Brown, Lewis R. Culture plate for surfaces. 4,598,050, Cl. 435-298.000.

Brown, William K.: *See—*
Fujii, Ray K.; and Brown, William K., 4,597,589, Cl. 280-821.000.

Bruin, Adrianus M. J., to Beta B.V. Safety device against overpressure particularly for gas pressure control apparatus. 4,597,409, Cl. 137-461.000.

Brunelli, Richard J.; and Carter, James C., Jr., to Varian Associates, Inc. Collimation system for electron arc therapy. 4,598,208, Cl. 250-515.100.

Brunson, David T.: *See—*
Walters, D. F.; Brunson, David T.; and Bell, William R., 4,597,455, Cl. 175-228.000.

Brusasco, Enzo, to Roltra S.p.A. Screw-nut screw coupling with ball circulation and a method for its assembly. 4,597,305, Cl. 74-424.80A.

Bruso, Loran H., to Warner-Lambert Company. Instrument protector. 4,597,493, Cl. 206-363.000.

Bryan, Bynum O., Jr.; and Seagrave, Earl. Leak detection system for roofs. 4,598,273, Cl. 340-539.000.

Bucher-Guyer AG: *See—*
Amstutz, Jean-Pierre, 4,597,250, Cl. 56-16.400.

Buchovecky, Kalman E.: *See—*
Ramser, Robert A.; Barch, Daniel R.; Buchovecky, Kalman E.; and Kuchera, Ray A., 4,597,919, Cl. 264-12.000.

Buck, Ernst: *See—*
Dolata, Hans; Meyle, Werner; Linke, Wilfried; Hagele, Hermann; and Buck, Ernst, 4,597,178, Cl. 30-138.000.

Buck, Rainer; Wessel, Wolf; and Stumpp, Gerhard, to Robert Bosch GmbH. Control system for air charge pressure in an internal combustion engine. 4,597,265, Cl. 60-602.000.

Budmiger, Hermann. Fire-proof cover and its use. 4,597,450, Cl. 169-50.000.

Budziak, Frank W.: *See—*
Burton, James O.; Adam, Timothy S.; Budziak, Frank W.; and Nekoloff, Michael W., 4,598,376, Cl. 364-470.000.

Budzol, Melvin: *See—*
Tloczynski, James J.; Budzol, Melvin; Ahola, Clifford J.; and Rine, James C., 4,597,536, Cl. 241-62.000.

Buelens, Edward; and Goossens, Carolus C., to Agfa-Gevaert N.V. Light-tight cassette. 4,597,658, Cl. 354-275.000.

Buell, Kenneth B., to Procter & Gamble Company, The. Waste-containment garment having disposable elasticized insert. 4,597,760, Cl. 604-397.000.

Buell, Kenneth B., to Procter & Gamble Company, The. Disposable elasticized waste-containment insert. 4,597,761, Cl. 604-397.000.

Buese, Mark A., to General Electric Company. Method for making norbornane anhydride substituted polyorganosiloxane. 4,598,135, Cl. 528-23.000.

Buhrer, Carl F., to GTE Laboratories Incorporated. Optical polarization restoration apparatus. 4,597,640, Cl. 350-405.000.

Bunawerke Huls GmbH: *See—*
Beck, Manfred, 4,598,132, Cl. 526-142.000.

Bunger, Paul: *See—*
Thoma, Martin; and Bunger, Paul, 4,598,016, Cl. 428-328.000.

Bunsch, Hellmut: *See—*
Horn, Peter; Bunsch, Hellmut; Gehm, Robert; and Marx, Matthias, 4,598,125, Cl. 525-183.000.

Buran, Ulrich: *See—*
Neuhauser, Hans J.; Buran, Ulrich; Fischer, Manfred; and Beyer, Horst, 4,597,939, Cl. 420-429.000.

Burgess, Lester E.; McGarry, Phillip E.; and Herman, David E., to Sohio Alternate Energy Development Co. Multistream, multiproduct beneficiation arrangement. 4,597,858, Cl. 209-166.000.

Burghardt, Wilfried, to Britax-Kolb GmbH & Co. Seat belt tensioning system. 4,597,545, Cl. 242-107.200.

Burghardt, Wilfried; Nilsson, Karl E.; and Ernst, Hans-Hellmut, to Britax-Kolb GmbH & Co. Pyrotechnic tensioner for vehicle safety belt. 4,597,586, Cl. 280-806.000.

Burk, Gerhard: *See—*
Mordau, Manfred; Burk, Gerhard; and Stolz, Albert, 4,597,323, Cl. 98-2.110.

Burkhardt, Joachim; Dreyer, Manfred; Klett, Dittmar; and Weyl, Helmut, to Robert Bosch GmbH. Gas sensor suitable for engine exhaust gases. 4,597,849, Cl. 204-424.000.

Burlington Industries, Inc.: *See—*
McGee, James N., Jr., 4,598,013, Cl. 428-290.000.

Burney, Charles F., to A.R.A. Manufacturing Company. Cruise control system and method with overspeed sensor. 4,597,465, Cl. 180-176.000.

Burns, Edgar, to Automation Industries, Inc. Resettable emergency release mechanism. 4,597,621, Cl. 339-90.00R.

Burov, Anatoly V.: *See—*
Terentiev, Otto A.; Burov, Anatoly V.; Vorobieva, Ekaterina Y.; Grudinka, Ekaterina I.; Nesterchuk, Gennady T.; Shapovalov, Oleg I.; Usmanov, Khamdam U.; Mirkamilov, Shavkat M.; Mirkamilov, Tolkun M.; and Sharkov, Vladimir V., 4,597,928, Cl. 264-87.000.

Burrage, Lawrence M.; Shaw, J. Howard; Marek, James R.; and Anderson, David W., to Cooper Industries, Inc. Capacitor fuse leader flipper. 4,598,265, Cl. 337-219.000.

Burroughs Corporation: *See—*
James, Christopher D.; and McNeal, Norman E., 4,598,308, Cl. 357-81.000.
Logsdon, Gary L.; Scheevel, Mark R.; and Williams, Frank A., Jr., 4,598,361, Cl. 364-200.000.
Loskorn, Richard A., 4,598,360, Cl. 364-200.000.
Wonsowicz, Casimir J.; and Canfield, Glenn R., 4,597,989, Cl. 427-99.000.

Burton, James O.; Adam, Timothy S.; Budziak, Frank W.; and Nekoloff, Michael W., to Richman Brothers Company. Method and apparatus for producing custom manufactured items. 4,598,376, Cl. 364-470.000.

Burza Resources Ltd.: *See—*
Deszynski, Andrew W.; and Tucque, Andre, 4,597,609, Cl. 299-6.000.

Buseth, Richard A., to Snap-Tite, Inc. Coupling apparatus. 4,597,413, Cl. 137-614.040.

Bush, J. Finley, to Aluminum Company of America. Halogen recovery. 4,597,953, Cl. 423-132.000.

Bush, James A.: *See—*
Matson, James A.; Myllymaki, Robert W.; Doyle, Terrence W.; and Bush, James A., 4,598,145, Cl. 536-1.100.

Buttinoni, Ada: *See—*
Doria, Gianfederico; Passarotti, Carlo; and Buttinoni, Ada, 4,598,090, Cl. 514-455.000.

Buxton, James L.: *See—*
Pierce, Gerald A.; Buxton, James L.; Peppers, Norman A.; and Vinzant, Warren J., 4,598,393, Cl. 369-46.000.

Byford, Derek C.; Green, Peter J.; and Lewis, Alun, to British Petroleum Company p.l.c., The. Dispersant composition. 4,597,893, Cl. 252-354.000.

C. & E. Fein GmbH & Co.: *See—*
Gentischer, Josef; and Rudolf, Boris, 4,597,227, Cl. 51-168.000.

C. Reichert Optische Werke AG: *See—*
Schindl, Klaus P., 4,597,644, Cl. 350-511.000.

Cabot Medical Corporation: *See—*
Kihn, Harry; and Ackman, C. F. Douglas, 4,597,379, Cl. 128-1.00R.

Caglione, Alexander J.: *See—*
Hinchey, Richard J.; and Caglione, Alexander J., 4,597,956, Cl. 423-328.000.

Camco, Incorporated: *See—*
Knox, Richard H., 4,597,445, Cl. 166-319.000.

Camerini, Pier Cesare P., to Officine Vittoria S.p.A. Machine for the continuous roasting of products such as coffee and barley, and method realizable with the said machine. 4,597,190, Cl. 34-57.00A.

Campbell, Donald N.; Vora, Kishore N.; and Davis, Robert C., Jr., to Allied Corporation. Ion gate sample gas inlet control for gas chromatograph analyzer. 4,597,299, Cl. 73-864.810.

Campbell, Richard W.: *See—*
Borman, Willem F. H.; and Campbell, Richard W., 4,598,129, Cl. 525-439.000.

Campbell, Willis R.; and Merkey, John A., to Sperry Corporation. Method of operating a roll baler. 4,597,248, Cl. 56-1.000.

Can-Eng Holdings, Ltd.: *See—*
Deline, Roger B., 4,597,735, Cl. 432-11.000.

Canadian Patents and Development Limited: *See—*
Guiver, Michael D.; Kutowy, Oleh; and Apsimon, John W., 4,598,137, Cl. 528-173.000.

Canfield, Glenn R.: *See—*
Wonsowicz, Casimir J.; and Canfield, Glenn R., 4,597,989, Cl. 427-99.000.

Canon Hanbai Kabushiki Kaisha: *See—*
Tano, Terukuni, 4,597,719, Cl. 417-317.000.

Canon Kabushiki Kaisha: *See—*
Honjo, Takeshi; Kitahara, Makoto; Suzuki, Yasumichi; and Takahata, Naomi, 4,598,323, Cl. 358-285.000.
Iwata, Yoshiki; Kawase, Nobuo; Tanaka, Yoshinori; Miyake, Takashi; and Kawaura, Hiroshi, 4,597,459, Cl. 177-210.00R.
Ohta, Tokuya; Yano, Yasuhiro; Matsufuji, Yohji; Haruta, Masahiro; and Eida, Tsuyoshi, 4,597,794, Cl. 106-20.000.
Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, 4,598,032, Cl. 430-58.000.
Suda, Yasuo; Alyfuku, Kiyoshi; Sunouchi, Akio; and Suzuki, Nobuyuki, 4,597,659, Cl. 354-409.000.
Tano, Terukuni, 4,597,719, Cl. 417-317.000.

Canter, Mark A. Rotating poppet valve system. 4,597,408, Cl. 137-331.000.

Cap, Heinrich, to Papst-Motoren GmbH & Co. KG. Circuit for regulating the rpm and phase of a motor. 4,598,239, Cl. 318-314.000.

Capasso, Federico; Focht, Marlin W.; Macrander, Albert T.; and Schwartz, Bertram, to AT&T Bell Laboratories. Method of making integrated circuits employing ion-bombarded InP layers. 4,597,165, Cl. 29-576.00B.

Capo-Gual, Christine; Delattre, Luc; and Hennequin, Jean-Claude, to Essilor International (Compagnie Generale d'Optique). Apparatus for the detection of eye sight defects and cassette for the operation of such an apparatus. 4,597,651, Cl. 351-243.000.

Caraluzzi, Mark: *See—*
Cardullo, Mario; Caraluzzi, Mark; and Schildbach, Peter, 4,597,325, Cl. 99-404.000.

Carbaugh, William L.: *See—*
Roche, Joseph R.; Alexander, Gabriel G.; and Carbaugh, William L., 4,597,447, Cl. 166-347.000.

Cardullo, Mario; Caraluzzi, Mark; and Schildbach, Peter, to Yankee Noodle Dandy, Inc. Rotary cooking apparatus. 4,597,325, Cl. 99-404.000.

Cari-All Inc.: *See—*
Trubiano, Antoine, 4,597,616, Cl. 312-246.000.

Carnegie, Alistair L., deceased; and by Carnegie, Norma E., executrix. Deep diving apparatus. 4,597,387, Cl. 128-201.270.

Carnegie, Norma E., executrix: *See—*
Carnegie, Alistair L., deceased; and Carnegie, Norma E., executrix, 4,597,387, Cl. 128-201.270.

Carr, Richard V. C.; Sawicki, John E.; and Toseland, Bernard A., to Air Products and Chemicals, Inc. Precipitative removal of nitrocresols from dinitrotoluene waste streams. 4,597,875, Cl. 210-710.000.

Carr, William W., to Transducer Limited Partnership. Eddy current proximeter. 4,598,260, Cl. 331-135.000.

Carrington, James E.; and Westcott, Gerald R., to International Business Machines Corporation. Print hammer flight time control system. 4,597,328, Cl. 101-93.130.

Carter, James C., Jr.: *See—*
Brunelli, Richard J.; and Carter, James C., Jr., 4,598,208, Cl. 250-515.100.

Caruana, Joseph, to Hozelock-ASL Limited. Lawn sprinkler. 4,597,528, Cl. 239-381.000.

Carus Corporation: *See—*
Mein, Peter G., 4,597,955, Cl. 423-184.000.

Casey, Robert F., to RCA Corporation. Television receiver that includes a frame store using non-interlaced scanning format with motion compensation. 4,598,309, Cl. 358-11.000.

Cassella Aktiengesellschaft: *See—*
Beyerle, Rudi; Bender, Heinz; Schindler, Ursula; Nitz, Rolf-Eberhard; and Martorana, Piero A., 4,598,079, Cl. 514-252.000.

Cataldo, Roy S., to General Motors Corporation. Multi-speed power transmission. 4,597,304, Cl. 74-329.000.

Catchman, Vernon C.: *See—*
Boyd, Dana M.; Catchman, Vernon C.; and Broderick, Kevin, 4,597,750, Cl. 493-346.000.

Causey, Charles E.: *See—*
Kacalieff, Christ D.; and Causey, Charles E., 4,597,594, Cl. 285-239.000.

Cauwet, Daniele: *See—*
Grollier, Jean F.; Dubief, Claude; and Cauwet, Daniele, 4,597,962, Cl. 424-47.000.

CDP, Ltd.: *See—*
Ecer, Gunes M., 4,597,456, Cl. 175-371.000.

Cegedur Societe de Transformation de l'Aluminium Pechiney: *See—*
Esmieu, Jean-Paul, 4,597,277, Cl. 72-182.000.

Celanese Corporation: *See—*
Conrad, Peter, 4,597,539, Cl. 242-18.0PW.
Trouw, Norman S., 4,598,099, Cl. 521-77.000.

Celli, Aldo. Modular wall panel and building wall constructed therefrom. 4,597,237, Cl. 52-601.000.

Cerberus AG: *See—*
Wagli, Peter; and Temperli, Stefan, 4,598,271, Cl. 340-511.000.

Chamberlain Manufacturing Corporation: *See—*
Iha, Kiyoshi, 4,597,428, Cl. 160-188.000.

Chamberlin, Edward R., to Standex International Corporation. Method of manufacturing a turnable microinductor. 4,597,169, Cl. 29-605.000.

Chan, Yuen H., to International Business Machines Corporation. Random access memory RAM employing complementary transistor switch (CTS) memory cells. 4,598,390, Cl. 365-230.000.

Chandross, Edwin A.; Dean, Robert E.; and Smolinsky, Gerald, to AT&T Bell Laboratories. Low temperature deposition of silicon oxides for device fabrication. 4,597,985, Cl. 427-39.000.

Chang, Chun-Nan: *See—*
Hamill, James; Digumarthi, Ramarao; Conlon, William; Cheng, Dau Y.; and Chang, Chun-Nan, 4,597,256, Cl. 60-39.050.

Chang, Eugene Y. C., to American Cyanamid Company. Catalyst systems for polyurethane compositions. 4,598,103, Cl. 521-126.000.
Chapin, David S.: *See*—
Kilmer, Paul R.; and Chapin, David S., 4,597,453, Cl. 173-171.000.
Charbonnages de France: *See*—
Merry, Jean-Louis, 4,597,529, Cl. 239-430.000.
Charles of the Ritz Group Ltd.: *See*—
Deckner, George E., 4,597,963, Cl. 424-59.000.
Charmilles Technologies, S.A.: *See*—
Balleys, Francois, 4,598,190, Cl. 219-69.00W.
Chaussures Andre: *See*—
Selignan, Olivier; Bourgain, Olivier; and Martin, Jean-Marie, 4,597,490, Cl. 198-468.500.
Chazan, Jean-Bernard: *See*—
Samreth, Soth; Bellamy, Francois; and Chazan, Jean-Bernard, 4,598,068, Cl. 514-25.000.
Chea, Ramon C. W., Jr.; Keegan, Kevin C.; Pothuri, Reddeppa N.; and Lloyd, Albert H., Jr., to ITT Corporation. Interface circuit for a subscriber line circuit. 4,598,173, Cl. 179-18.0FA.
Chellis, Leroy N., to International Business Machines Corporation. Process of laminating with an epoxy composition. 4,597,996, Cl. 427-386.000.
Chelminski, Paul, to Bolt Technology Corporation. Method and system for well velocity shooting and vertical seismic profiling. 4,597,464, Cl. 181-114.000.
Chemische Werke Huls AG: *See*—
Disteldorf, Josef; Haage, Hans-Jurgen; and Schnurbusch, Horst, 4,598,121, Cl. 524-874.000.
Chemische Werke Huls Aktiengesellschaft: *See*—
Scharf, Helmut, 4,598,157, Cl. 549-239.000.
Chemla, Daniel S.; Miller, David A. B.; and Smith, Peter W., to AT&T Bell Laboratories. Nonlinear optical apparatus. 4,597,638, Cl. 350-354.000.
Chen, Chao-Yang. Pipe wrench. 4,597,315, Cl. 81-129.500.
Chen, Gilbert, to Glitsch, Inc. Method of and apparatus for intermediate lamella vapor liquid contact. 4,597,916, Cl. 261-94.000.
Chen, Jack C. Field-interrupting contactless ignition system for internal combustion engine. 4,597,366, Cl. 123-146.50A.
Chen, Ming H., to TRW Inc. Quasi-optical waveguide filter. 4,598,262, Cl. 333-208.000.
Chen, Otis Y.: *See*—
Duhl, David N.; and Chen, Otis Y., 4,597,809, Cl. 148-404.000.
Cheng, Dau Y.: *See*—
Hamill, James; Digumarthi, Ramarao; Conlon, William; Cheng, Dau Y.; and Chang, Chun-Nan, 4,597,256, Cl. 60-39.050.
Cheng, Shang-I. Fluidized bed reactor system for integrated gasification. 4,597,771, Cl. 48-77.000.
Chenot, Gary D. Device for opening bottled water containers. 4,597,423, Cl. 141-330.000.
Chenoweth, James A.: *See*—
Woolington, John C.; and Chenoweth, James A., 4,597,700, Cl. 409-292.000.
Chetty, Pandipati R. K.: *See*—
Fair, Donald G.; and Chetty, Pandipati R. K., 4,598,351, Cl. 363-49.000.
Chevillot: *See*—
Chevillot, Beatrix B., 4,597,208, Cl. 40-301.000.
Chevillot, Beatrix B., to Chevillot. Cattle identification tag. 4,597,208, Cl. 40-301.000.
Chevron Research Company: *See*—
Allen, Jackie C., 4,597,180, Cl. 30-366.000.
Denisevich, Peter, Jr.; Schroeder, Albert H.; Kurkov, Victor P.; and Suzuki, Shigeto, 4,597,896, Cl. 252-500.000.
Feldman, Richard B., 4,598,277, Cl. 340-604.000.
Muir, Francis, 4,598,391, Cl. 367-25.000.
Chiang, Anne; and Johnson, Noble M., to Xerox Corporation. Depletion mode thin film semiconductor photodetectors. 4,598,305, Cl. 357-23.700.
Chiba, Toshiyuki: *See*—
Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tsuji, Kiyoshi, 4,598,147, Cl. 544-238.000.
Chino, John J.; Swayne, David S.; and Gilmour, Richard J., to United States of America, Navy. Electronic module insertion and retraction mechanism. 4,597,173, Cl. 29-741.000.
Chris Kaye Plastics Corp.: *See*—
Kacalieff, Christ D.; and Causey, Charles E., 4,597,594, Cl. 285-239.000.
Christiansen, Lars: *See*—
Diderichsen, Boerge K.; and Christiansen, Lars, 4,598,048, Cl. 435-172.300.
Christie, Peter A.; and Hoyle, Charles E., to Armstrong World Industries, Inc. Embossed material and method for producing the same from a photocrosslinkable polyurethane. 4,598,009, Cl. 428-172.000.
Chu Associates, Inc.: *See*—
Faigen, Ivan; Eovine, Michael; and Thombs, David, 4,598,296, Cl. 343-730.000.
Chu, Grace M. M. Oral hygiene instrument for use with orthodontial appliances and method of cleaning same. 4,597,398, Cl. 132-92.00R.
Chua, David L.: *See*—
Doddapaneni, Narayan; and Chua, David L., 4,598,029, Cl. 429-50.000.
Chuang, Patrick T.; and Marr, George, to Advanced Micro Devices, Inc. Capacitive memory signal doubler cell. 4,598,387, Cl. 365-149.000.
Ciba-Geigy Corporation: *See*—
Adam, Jean-Marie, 4,598,155, Cl. 548-253.000.
Goldenberg, Merrill, 4,598,122, Cl. 525-61.000.
Martin, Pierre, 4,598,156, Cl. 548-501.000.
Ciechanowski, Mark; and Faraday, Robin C., to Rockwell International Corporation. Vacuum wand holder. 4,597,551, Cl. 248-314.000.
Cieslak, Ronald H.: *See*—
Schechtman, Melvin A.; and Cieslak, Ronald H., 4,598,215, Cl. 307-355.000.
Cincinnati Milacron Inc.: *See*—
Holmes, John G.; Messina, Elena R.; Resnick, Brian J.; and Teach, Charles C., 4,598,380, Cl. 364-513.000.
Cipolla, Giovanni, to Fiat Auto S.p.A. Regulation device for a turbo compressor unit for supercharging an internal combustion engine. 4,597,264, Cl. 60-602.000.
Citizen Watch Co., Ltd.: *See*—
Kihara, Hiroyuki, 4,597,673, Cl. 368-80.000.
Koyama, Isao; and Hatsuse, Toshikazu, 4,597,228, Cl. 51-235.000.
CLAAS OHG: *See*—
Clostermeyer, Gerhard, 4,597,241, Cl. 53-116.000.
Clark, Dennis E.: *See*—
Andreescu, George; Clark, Dennis E.; and Kerr, William J., 4,598,074, Cl. 514-196.000.
Clark, Larry L.; DeArdo, Carmen E.; and Shaffer, Barry A., to AT&T Bell Laboratories. Adaptive delayed polling of sensors. 4,598,363, Cl. 364-200.000.
Clark, Lloyd E.; and Emery, Ralph E., to Sakura Telecommunications, Inc. Telephone privacy system. 4,598,179, Cl. 179-84.00C.
Clarke, Frederick W.: *See*—
Allen, Henry C.; and Clarke, Frederick W., 4,597,924, Cl. 264-3.600.
Clarke, Ronald A. W., to Animotion Inc. Retractable traffic delineator. 4,597,691, Cl. 404-11.000.
Classic Corporation: *See*—
Fogel, Isaac; and Keefer, Donald W., 4,597,120, Cl. 5-451.000.
Clearwater Technologies, Inc.: *See*—
Gruenwald, James D., 4,597,692, Cl. 404-25.000.
Clegg, John E. Concave conical foil-filament lamp. 4,598,226, Cl. 313-341.000.
Clementson, David D.: *See*—
Wheeler, William R.; Kudinar, Rusmin; Kren, George J.; and Clementson, David D., 4,597,708, Cl. 414-331.000.
Clostermeyer, Gerhard, to CLAAS OHG. Large baling press for agricultural products. 4,597,241, Cl. 53-116.000.
Cobe, Walter T., Jr. Combination Firefighter's tool. 4,597,123, Cl. 7-138.000.
Coccioni, Renzo: *See*—
Schotzau, Hans-Jorg; Coccioni, Renzo; and Sturzenegger, Christian, 4,598,188, Cl. 200-148.00A.
Codart, Inc.: *See*—
Yarbrough, Charles J.; Strachan, Alan F.; and Weisman, Joe, 4,598,288, Cl. 340-825.340.
Coe, Thomas D., to QA Technology Company. Electrical connector for electrical circuit test probe and connector. 4,597,622, Cl. 339-95.00R.
Coffman, John A., to Wright-Malta Corporation. Fixed kiln with rotor steam gasifier. 4,597,772, Cl. 48-111.000.
Coflexip: *See*—
Legallais, Lucien; and Kuntz, Bernard, 4,597,276, Cl. 72-49.000.
Cohen, Edgar C. Microencapsulated astringent hemostatic agents and methods of use. 4,597,960, Cl. 424-28.000.
Cohen, Joseph; Gurtner, Bernard; and Bertaud, Yves, to Aluminum Pechiney. Process for the continuous production of aluminum by the carbochlorination of alumina and igneous electrolysis of the chloride obtained. 4,597,840, Cl. 204-67.000.
Colas, Francois. Device for connecting a tube and a sheet metal element. 4,597,687, Cl. 403-242.000.
Colborne Manufacturing Company: *See*—
Scheeler, Fred; and Eisendrath, David C., 4,597,705, Cl. 414-30.000.
Coleman, Clint, to North Wind Power Company, Inc. Wooden wind turbine blade manufacturing process. 4,597,715, Cl. 416-229.00R.
Coleman Company, Inc., The: *See*—
Pollard, Jerry B., 4,597,346, Cl. 114-39.000.
Coles, Kenneth F.: *See*—
McCausland, Dominick A. C.; Shirvill, Leslie C.; and Coles, Kenneth F., 4,597,734, Cl. 431-328.000.
Colgate, Gilbert, Jr., to U.S. Banknote Corporation. Method for manufacturing card with three-dimensional label incorporated therein. 4,597,814, Cl. 156-219.000.
Colgate-Palmolive Company: *See*—
Colodney, Daniel; and Kenkare, Divaker B., 4,597,887, Cl. 252-106.000.
Collins, Clifford W. Trawling apparatus. 4,597,214, Cl. 43-9.000.
Collins, Jerry C.; Warner, Charles P.; Henkener, Jerry A.; and Glauser, Rolf, to Mobil Oil Corporation. Fiber optic penetrator for offshore oil well exploration and production. 4,598,290, Cl. 340-850.000.
Collins, Patrick V.: *See*—
Goudy, Paul R., Jr.; Doolittle, William P.; Jenkins, Thomas E.; Beemster, Bernard J.; Roos, William N.; and Collins, Patrick V., 4,597,530, Cl. 239-452.000.
Collins, Richard J.; Wagstaff, Frank E.; and Wagstaff, William G., to Wagstaff Engineering, Inc. Molding device. 4,597,432, Cl. 164-444.000.
Colodney, Daniel; and Kenkare, Divaker B., to Colgate-Palmolive Company. Germicidal hard surface cleaning composition. 4,597,887, Cl. 252-106.000.

Combis, Chris: *See*—
Moore, Harry O., 4,598,185, Cl. 200-80.00R.
Combustion Engineering, Inc.: *See*—
Francis, Alex W., Jr. deceased, 4,597,874, Cl. 210-708.000.
Commissariat a l'Energie Atomique: *See*—
Barraud, Andre ; Leloup, Jean; and Ruaudel, Annie, 4,598,056, Cl. 502-4.000.
Compagnie Francaise des Petroles: *See*—
Helderle, Paul M., 4,597,446, Cl. 166-322.000.
Conklin, Glenn T., to Gerber Products Company. Truck loading apparatus and method. 4,597,491, Cl. 198-642.000.
Conlon, William: *See*—
Hamill, James; Digumarthi, Ramarao; Conlon, William; Cheng, Dau Y.; and Chang, Chun-Nan, 4,597,256, Cl. 60-39.050.
Connett, Steven T.: *See*—
Griffith, Eugene R., Jr.; and Connett, Steven T., 4,598,418, Cl. 381-83.000.
Conoco Inc.: *See*—
Beck, Jeffrey L., 4,597,859, Cl. 209-211.000.
Conrad, Peter, to Celanese Corporation. Apparatus for cutting and aspirating filamentary material to waste. 4,597,539, Cl. 242-18.0PW.
Construction Specialties, Inc.: *See*—
Olsen, Robert W., 4,597,235, Cl. 52-509.000.
Continental Disc Corporation: *See*—
Mozley, Robert M.; and Wilson, Bryce H., 4,597,505, Cl. 220-89.00A.
Continental Gummi-Werke Aktiengesellschaft: *See*—
Mauk, Gerhard; Huinink, Heinrich; Seitz, Hans; Frerichs, Udo; Rach, Heinz-Dieter; and Poque , Dionysius, 4,597,426, Cl. 152-379.500.
Contreras, Patricia: *See*—
Rice, Kenner C.; Rafferty, Michael F.; Jacobson, Arthur E.; Contreras, Patricia; O'Donohue, Thomas L.; Lessor, Ralph A.; and Mattson, Mariena V., 4,598,153, Cl. 546-229.000.
Conval, Inc.: *See*—
Siver, Chester A., 4,597,560, Cl. 251-163.000.
Cook, Gary W.: *See*—
Brackhahn, Virgil D.; and Cook, Gary W., 4,598,341, Cl. 362-125.000.
Cook, Henry R.: *See*—
Price, Gordon L.; Ruddick, Howard G.; and Cook, Henry R., 4,598,184, Cl. 200-61.180.
Cook, James W.; and Evans, Tery J., to Square D Company. Vent arrangement for high amperage molded case circuit breaker. 4,598,186, Cl. 200-144.00R.
Cook, Melvin S. Rapid LPE crystal growth. 4,597,823, Cl. 156-622.000.
Cook, Richard: *See*—
Weis, Philip J.; Cook, Richard; Kaminski, David C.; and Smith, James E., 4,597,301, Cl. 74-15.860.
Cooper, Frank W., Jr.: *See*—
Brill, Bernard A., III; Junker, Warren R.; White, John K.; Rana, Iftikhar A.; Bevilacqua, Bruce W.; Cooper, Frank W., Jr.; and Taszarek, Bruce J., 4,597,294, Cl. 73-623.000.
Cooper Industries, Inc.: *See*—
Burrage, Lawrence M.; Shaw, J. Howard; Marek, James R.; and Anderson, David W., 4,598,265, Cl. 337-219.000.
Galloup, Clifford L.; and Stack, Paul D., Jr., 4,597,419, Cl. 140-124.000.
Kilmer, Paul R.; and Chapin, David S., 4,597,453, Cl. 173-171.000.
Coopsette S.C.R.L.: *See*—
Paterlini, Romualdo, 4,597,114, Cl. 4-662.000.
Coppus Engineering Corporation: *See*—
Wlodkowski, Henry W., 4,597,679, Cl. 384-462.000.
Corbett, Robert J., to Huck Manufacturing Company. Pull type installation tool. 4,597,263, Cl. 60-534.000.
Corelli, Giancarlo: *See*—
Sfondrini, Francesco; and Corelli, Giancarlo, 4,597,192, Cl. 34-66.000.
Cornacchia, Vincent, to General Machine Design, Inc. Automatic operating palletizer. 4,597,707, Cl. 414-62.000.
Cornellier, Maurice H. Lawnmower. 4,597,251, Cl. 56-17.600.
Corrigan, Charles E.: *See*—
Maertins, Hans F. W.; Mays, James C.; and Corrigan, Charles E., 4,597,675, Cl. 374-115.000.
Coscia, Charles M.; and Scott, Michael K., to D. L. Auld Company, The. Lock cover mechanism. 4,597,274, Cl. 70-455.000.
Costello, Samuel J.: *See*—
Brandt, David S.; and Costello, Samuel J., 4,597,281, Cl. 72-318.000.
Cottingham, Hugh V. Agglutination reagent detection system. 4,597,944, Cl. 422-73.000.
Couillard, Francois, to Groupe Industriel de Realisations et Applications. Chromatography apparatus. 4,597,866, Cl. 210-198.200.
Cousens, Donald E.: *See*—
Kurtz, John A.; Cousens, Donald E.; and Dufour, Mark D., 4,597,519, Cl. 228-102.000.
Cox, Randall P. Electronic monitoring apparatus. 4,598,272, Cl. 340-539.000.
Cozzolino, Gerald: *See*—
Wuthrich, Paul; Daigle, Lyman R.; and Cozzolino, Gerald, 4,598,337, Cl. 361-401.000.
Craig, James E.: *See*—
Bacon, Jeffery E.; Craig, James E.; and Pedersen, Mark K., 4,597,845, Cl. 204-206.000.
Crane, David O.; McDonald, Thomas; and Horner, Ronald F. Torque transducing attachments for air-driven impact tools. 4,597,296, Cl. 73-862.330.
Crawford, Donald C.: *See*—
Bollinger, Lawrence R.; and Crawford, Donald C., 4,597,934, Cl. 376-235.000.
Creative Planters Inc.: *See*—
Adair, Brenda A.; and Stevens, Kent A., 4,597,221, Cl. 47-66.000.
Creative Technology, Inc.: *See*—
Crosby, Kennith D.; Tuten, William J.; Black, Harold W.; and Bergquist, Bertil R., 4,597,487, Cl. 194-209.000.
Credelle, Thomas L., to RCA Corporation. Electron beam convergence and scanning structures for flat panel display device. 4,598,227, Cl. 313-422.000.
Crosby, Kennith D.; Tuten, William J.; Black, Harold W.; and Bergquist, Bertil R., to Creative Technology, Inc. Method and apparatus for selective scrap metal collections. 4,597,487, Cl. 194-209.000.
Crosfield Electronics Limited: *See*—
Pugsley, Peter C., 4,598,282, Cl. 340-703.000.
Crown Zellerbach Corporation: *See*—
Reba, Imants; and Pollock, Rodney E., 4,597,573, Cl. 271-195.000.
CryoLife, Inc.: *See*—
Entrekin, Stephen, 4,597,266, Cl. 62-46.000.
Cucci, Gerald R., to Rosemount Inc. Pressure compensated differential pressure sensor and method. 4,598,381, Cl. 364-558.000.
Curby, Robert D.; and McCammon, George H., to Litton Systems, Inc. Dither controller for ring laser angular rotation sensor. 4,597,667, Cl. 356-350.000.
Cuschera, Casper. Spring sealed drain fitting. 4,597,112, Cl. 4-287.000.
Cushman, Robert L.; Koester, Arlan; and Eveland, Michael, to King Seeley Thermos Co. (Halsey Taylor Div.). Barrier-free water cooler. 4,597,525, Cl. 239-28.000.
Cutrara, Anthony. Packaged kiln dried firewood. 4,597,189, Cl. 34-38.000.
Cutter, Louis A., to Unites States Steel Corporation. Impact modified methyl methacrylate polymer. 4,598,123, Cl. 525-84.000.
CXC Corporation: *See*—
Nelson, Gary A.; and Godding, Patrick N., 4,598,397, Cl. 370-110.100.
Cyphelly, Ivan: *See*—
Porel, Louis-Claude; and Cyphelly, Ivan, 4,597,483, Cl. 192-59.000.
D. L. Auld Company, The: *See*—
Coscia, Charles M.; and Scott, Michael K., 4,597,274, Cl. 70-455.000.
Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Nozaka, Yoshiki, 4,597,820, Cl. 156-353.000.
Daigle, Lyman R.: *See*—
Wuthrich, Paul; Daigle, Lyman R.; and Cozzolino, Gerald, 4,598,337, Cl. 361-401.000.
Daigou, Yuzuru; and Yagi, Takeo, to Niigata Engineering Co., Ltd. Articulate joint in laser processing machines. 4,597,642, Cl. 350-486.000.
Daimler-Benz AG: *See*—
Forster, Hans-Joachim, 4,597,336, Cl. 104-130.000.
Daimler-Benz Aktiengesellschaft: *See*—
Mordau, Manfred; Burk, Gerhard; and Stolz, Albert, 4,597,323, Cl. 98-2.110.
Dallas Smith Engineering Corporation: *See*—
Smith, Earl D., 4,597,712, Cl. 414-549.000.
Dallessandro, Susan M.; Archer, Wesley L.; and Krupp, Stephen P., to Dow Chemical Company, The. Solvent blend for removing flux residues. 4,597,890, Cl. 252-153.000.
Dallwig, Claus: *See*—
Forkel, Michael; Dallwig, Claus; and Volk, Hans-Joachim, 4,597,607, Cl. 297-468.000.
Dana Corporation: *See*—
Weis, Philip J.; Cook, Richard; Kaminski, David C.; and Smith, James E., 4,597,301, Cl. 74-15.860.
Dananberg, Howard J. Human shoe sole. 4,597,195, Cl. 36-28.000.
Danfoss A/S: *See*—
Petersen, Hans C.; Thomsen, Svend E.; and Hansen, Hans L., 4,597,725, Cl. 418-61.00B.
Daudet, Howard C.; and Bagley, Weldon D., to Garrett Corporation, The. Fluidized bed combustor. 4,597,362, Cl. 122-4.00D.
Davies, David H. J.: *See*—
Moore, Peter E.; and Davies, David H. J., 4,597,451, Cl. 169-61.000.
Davis, Alan E., to Edwards & Jones Limited. Filter press plate separation devices. 4,597,862, Cl. 210-106.000.
Davis, Larry; and Klein, Joseph T., to Hoechst-Roussel Pharmaceuticals Inc. 6-fluoro-3-[3-(oxoheterocyclo)propyl]-1,2-benzisoxazoles. 4,598,152, Cl. 546-198.000.
Davis, Loren L., to Kraft, Inc. Soft cream cheese product. 4,597,971, Cl. 426-36.000.
Davis, Robert C., Jr.: *See*—
Campbell, Donald N.; Vora, Kishore N.; and Davis, Robert C., Jr., 4,597,299, Cl. 73-864.810.
Davis, William B.: *See*—
Norrgran, Daniel A.; and Davis, William B., 4,597,857, Cl. 209-166.000.
De La Rue Systems Limited: *See*—
Huckle, Ralph E., 4,597,340, Cl. 109-45.000.
Dean, Alvin; and Heath, Rodney T. Gas heating system for dehydrators and the like. 4,597,733, Cl. 431-285.000.
Dean, Mark E.; and Moeller, Dennis L., to International Business Machines Corporation. Data processing system including a main

processor and a co-processor and co-processor error handling logic. 4,598,356, Cl. 364-200.000.

Dean, Robert E.: *See—*
Chandross, Edwin A.; Dean, Robert E.; and Smolinsky, Gerald, 4,597,985, Cl. 427-39.000.

De Angelis, Giancarlo; Saglimbeni, Renato; and Mainardi, Riccardo, to Alfa Romeo Auto S.p.A. Ignition control device for an internal combustion engine. 4,598,371, Cl. 364-431.040.

DeArdo, Carmen E.: *See—*
Clark, Larry L.; DeArdo, Carmen E.; and Shaffer, Barry A., 4,598,363, Cl. 364-200.000.

Deckner, George E., to Charles of the Ritz Group Ltd. Moisture-resistant skin treatment compositions. 4,597,963, Cl. 424-59.000.

DeFrancesco, James; and Freiman, Scott L., to Financial Design Systems, Inc. Financial quotation system using synthesized speech. 4,598,367, Cl. 364-408.000.

Degussa Aktiengesellschaft: *See—*
Schonenberger, Helmut; Wappes, Beate; Jennerwein, Margaretha; von Angerer, Erwin; and Engel, Jurgen, 4,598,091, Cl. 514-492.000.

Delalande S.A.: *See—*
Strolin-Benedetti, Margherita; Guerret, Patrick G.; Langlois, Michel; and Dostert, Philippe L., 4,598,084, Cl. 514-374.000.

Delameter, William D. Method for processing flexible sheets. 4,597,982, Cl. 427-2.000.

Delannoy, Francis: *See—*
Neel, Henri; and Delannoy, Francis, 4,597,833, Cl. 203-49.000.

Delattre, Luc: *See—*
Capo-Gual, Christine; Delattre, Luc; and Hennequin, Jean-Claude, 4,597,651, Cl. 351-243.000.

Deline, Roger B., to Can-Eng Holdings, Ltd. High-efficiency porcelain enameling furnace. 4,597,735, Cl. 432-11.000.

D'Elio, Carmine: *See—*
Geissler, Robert G.; and D'Elio, Carmine, 4,598,312, Cl. 358-118.000.

Dempsey, Barry J.: *See—*
McQuary, Charles R.; and Dempsey, Barry J., 4,597,693, Cl. 405-176.000.

Demus, Dietrich: *See—*
Zaschke, Horst; Vorbrodt, Hans-Matthias; Fuchs, Wilfried; Wiegeleben, Adelbert; and Demus, Dietrich, 4,597,892, Cl. 252-299.610.

Denisevich, Peter, Jr.; Schroeder, Albert H.; Kurkov, Victor P.; and Suzuki, Shigeto, to Chevron Research Company. Carbazole-oxadiazole electroactive polymers. 4,597,896, Cl. 252-500.000.

Deno, Norman S., to Research Corporation. Electronic stethoscope. 4,598,417, Cl. 381-67.000.

Deroche, Raymond-Yves; Bourdon, Yves; and Faessel, Andre , to Societe Anonyme Dite: SACILOR. Method for straightening a rail and straightened rail. 4,597,283, Cl. 72-378.000.

DeSoto, Inc.: *See—*
Sekmakas, Kazys; and Shah, Raj, 4,598,109, Cl. 523-414.000.

de Souza, Noel J.: *See—*
Lal, Bansi; Dornauer, Horst; Bhattacharya, Bani K.; Dohadwalia, Alihussein N.; and de Souza, Noel J., 4,598,148, Cl. 544-252.000.

Deszynski, Andrew W.; and Tucque, Andre, to Burza Resources Ltd. Method of melting sulphur. 4,597,609, Cl. 299-6.000.

Deubel, Reinhold: *See—*
Uhrig, Heinz; Ehl, Klaus; and Deubel, Reinhold, 4,597,906, Cl. 260-401.000.

Devaney, Anthony J., to Schlumberger Technology Corporation. Diffraction tomography systems and methods with arbitrary source and detector array surfaces. 4,598,366, Cl. 364-400.000.

Devino, Vincent A., to Grumman Aerospace Corporation. Electronic standby flight instrument. 4,598,292, Cl. 340-973.000.

Devoy, Ralph P.: *See—*
Ross, Clive; and Devoy, Ralph P., 4,598,275, Cl. 340-573.000.

Devrient, Ludwig: *See—*
Maurer, Thomas; and Devrient, Ludwig, 4,597,592, Cl. 283-75.000.

DeWitt, Nicklas R., to X-Ten Corporation. Hook for retaining container corner casting. 4,597,701, Cl. 410-84.000.

Diaz, Zaida, to Shell Oil Company. Process for inhibiting hydrates while producing moist CO_2 from subterranean reservoirs. 4,597,779, Cl. 55-32.000.

Diderichsen, Boerge K.; and Christiansen, Lars, to Novo Industri A/S. Preparation of a maltogenic amylase enzyme. 4,598,048, Cl. 435-172.300.

Diebold, Incorporated: *See—*
Hill, Jeffrey A.; Yohn, Robert L.; Modi, Ashok L.; and Newton, Kevin H., 4,597,330, Cl. 101-93.010.

Digumarthi, Ramarao: *See—*
Hamill, James; Digumarthi, Ramarao; Conlon, William; Cheng, Dau Y.; and Chang, Chun-Nan, 4,597,256, Cl. 60-39.050.

Dilgren, Richard E.; Lau, Hon C.; and Hirasaki, George J., to Shell Oil Company. Reservoir preflushing process for increasing the rate of surfactant transport in displacing oil with injected steam and steam-foaming surfactant. 4,597,442, Cl. 166-272.000.

Dimitriou, Michael H., to W. Schmidt GmbH & Co. KG. Method of concentrating grape juice. 4,597,978, Cl. 426-492.000.

Discovision Associates: *See—*
Efron, Edward; McPherson, James O.; and Kim, Young B., 4,598,324, Cl. 358-341.000.

Disko, Harry: *See—*
Rehkemper, Steven F.; and Disko, Harry, 4,597,744, Cl. 446-278.000.

Disteldorf, Josef; Haage, Hans-Jurgen; and Schnurbusch, Horst, to Chemische Werke Huls AG. Cold-crosslinking polyurethane dispersions, manufacture and use of the same. 4,598,121, Cl. 524-874.000.

Dr. Ing. Rudolf Hell GmbH: *See—*
Angelbeck, Rolf; Gesell, Reinhard; and Goessner, Matthias, 4,597,678, Cl. 384-452.000.

Dr. Werner Freyberg: *See—*
Friemel, Wolfgang; and Ehret, Reiner, 4,597,218, Cl. 43-131.000.

Doddapaneni, Narayan; and Chua, David L., to Honeywell Inc. Reversal resistant non-aqueous electrochemical cell. 4,598,029, Cl. 429-50.000.

Dodge, Dennis W., to Itek Corporation. Paper guide with width sensing and width indication system. 4,597,652, Cl. 354-7.000.

Doggett, Eric L., to ITT Corporation. Test apparatus for PCM/FDM transmultiplexer. 4,598,398, Cl. 370-17.000.

Dohadwalla, Alihussein N.: *See—*
Lal, Bansi; Dornauer, Horst; Bhattacharya, Bani K.; Dohadwalla, Alihussein N.; and de Souza, Noel J., 4,598,148, Cl. 544-252.000.

Dolan, Cyril F., to Hughes Aircraft Company. Thermally actuated rocket motor safety system. 4,597,261, Cl. 60-223.000.

Dolata, Hans; Meyle, Werner; Linke, Wilfried; Hagele, Hermann; and Buck, Ernst, to Andreas Stihl. Saw chain sharpener. 4,597,178, Cl. 30-138.000.

Dolfi, James W. Automatic pilot for sailboat. 4,597,349, Cl. 114-144.00A.

Dombrowski, Theodor, to Wilhelm Hegenscheidt Gesellschaft mbH. Method and apparatus for reprofiling wheels. 4,597,143, Cl. 29-27.00R.

Donaldson Company, Inc.: *See—*
Gieseke, Steven S., 4,597,415, Cl. 137-875.000.

Donato, Dominic A. Device for aligning the dental X-ray machine to the film in angular positions and duplicating radiographic views. 4,598,416, Cl. 378-168.000.

Donohue, Paul C., to Du Pont de Nemours, E. I., and Company. Hexaboride resistor composition. 4,597,897, Cl. 252-518.000.

Doolittle, William P.: *See—*
Goudy, Paul R., Jr.; Doolittle, William P.; Jenkins, Thomas E.; Beemster, Bernard J.; Roos, William N.; and Collins, Patrick V., 4,597,530, Cl. 239-452.000.

Doria, Gianfederico; Passarotti, Carlo; and Buttinoni, Ada, to Farmitalia Carlo Erba, S.p.A. Condensed benzopyrone derivatives. 4,598,090, Cl. 514-455.000.

Dornauer, Horst: *See—*
Lal, Bansi; Dornauer, Horst; Bhattacharya, Bani K.; Dohadwalla, Alihussein N.; and de Souza, Noel J., 4,598,148, Cl. 544-252.000.

Dorsman, Adrian K.: *See—*
Shutt, Sidney G.; and Dorsman, Adrian K., 4,598,270, Cl. 340-347.0NT.

Doster, Robert C.; and Kahn, Karen F., to Nestec S.A. Process for producing shelf stable pasta containing product. 4,597,976, Cl. 426-325.000.

Dostert, Philippe L.: *See—*
Strolin-Benedetti, Margherita; Guerret, Patrick G.; Langlois, Michel; and Dostert, Philippe L., 4,598,084, Cl. 514-374.000.

Dow Chemical Company, The: *See—*
Dallessandro, Susan M.; Archer, Wesley L.; and Krupp, Stephen P., 4,597,890, Cl. 252-153.000.
Volk, Henry, 4,598,119, Cl. 524-215.000.

Dow Corning Corporation: *See—*
Ziemelis, Maris J.; and Roth, Charles A., 4,597,964, Cl. 424-70.000.

Dow, Robert: *See—*
Rymal, Theodore R., Jr., 4,597,863, Cl. 210-117.000.

Doyle, Terrence W.: *See—*
Matson, James A.; Myllymaki, Robert W.; Doyle, Terrence W.; and Bush, James A., 4,598,145, Cl. 536-1.100.

Drackett Company, The: *See—*
Bottom, Carey B.; Gilmore, Jane F.; and Martin, John L., Jr., 4,597,941, Cl. 422-37.000.

Dresser Industries, Inc.: *See—*
Henry, Ralph E., 4,597,147, Cl. 29-213.00R.
Walters, D. F.; Brunson, David T.; and Bell, William R., 4,597,455, Cl. 175-228.000.

Drexhage, Gerrit K. Adjustable torsion bar assembly. 4,597,568, Cl. 267-154.000.

Drexler Technology Corporation: *See—*
Pierce, Gerald A.; and Myers, Gregory K., 4,598,196, Cl. 235-454.000.
Pierce, Gerald A.; Buxton, James L.; Peppers, Norman A.; and Vinzant, Warren J., 4,598,393, Cl. 369-46.000.

Dreyer, Manfred: *See—*
Burkhardt, Joachim; Dreyer, Manfred; Klett, Dittmar; and Weyl, Helmut, 4,597,849, Cl. 204-424.000.

Dreyfuss, Patricia M.: *See—*
Miller, Richard S.; Bright, Randall P.; Vargo, Richard D.; and Dreyfuss, Patricia M., 4,598,012, Cl. 428-228.000.

Dries, Michael F.; and Gurnee, Mark N., to Honeywell Inc. Input compression apparatus for charge coupled devices. 4,598,414, Cl. 377-58.000.

Driessen, Edgar, to Bautex Adolf Stover Sohne KC. Vertical window blind slats. 4,597,429, Cl. 160-236.000.

Droppleman, J. Patrick; Olson, Iner C.; Phillip, Jeffrey S.; and Berning, Steven K., to Ocenco Incorporated. Hinge pin and hinge pin tool. 4,597,137, Cl. 24-33.00P.

Drysdale, Milton G.: *See—*
Masover, Gerald K.; and Drysdale, Milton G., 4,598,045, Cl. 435-34.000.

Dubief, Claude: *See*—
Grollier, Jean F.; Dubief, Claude; and Cauwet, Daniele, 4,597,962, Cl. 424-47.000.

Ducote, Marjorie E., to United States of America, Army. Prevention of unwanted cure catalysis in isocyanate cured binders. 4,597,811, Cl. 149-19.920.

Duffner, Paul: *See*—
Frank, Gerhard; Neubauer, Gerald; Duffner, Paul; and Wilfinger, Hans J., 4,598,058, Cl. 502-183.000.

Duffy, LaVern N. Automobile windshield cover. 4,597,608, Cl. 296-95.00C.

Dufour, Mark D.: *See*—
Kurtz, John A.; Cousens, Donald E.; and Dufour, Mark D., 4,597,519, Cl. 228-102.000.

Duhl, David N.; and Chen, Otis Y., to United Technologies Corporation. High strength hot corrosion resistant single crystals containing tantalum carbide. 4,597,809, Cl. 148-404.000.

Du Pont de Nemours, E. I., and Company: *See*—
Bartlett, Philip L., 4,597,895, Cl. 252-392.000.
Donohue, Paul C., 4,597,897, Cl. 252-518.000.
Farnham, William B.; Middleton, William J.; and Sogah, Dotsevi Y., 4,598,161, Cl. 564-101.000.
Felten, John J., 4,598,037, Cl. 430-281.000.
Golike, Ralph C., 4,597,920, Cl. 264-22.000.

Durant, Will G., to Westmont, Inc. Impeller packing machine with pre-conditioning hopper. 4,597,510, Cl. 222-195.000.

Durbin, Daniel P., to Shell Oil Company. Molding RF moldable thermoplastic compositions. 4,597,922, Cl. 264-26.000.

Duvvury, Charvaka; and Strawn, Russel W., to Texas Instruments Incorporated. Single-ended CMOS sense amplifier. 4,598,389, Cl. 365-208.000.

Dwosh, Jack; and Edwards, Clive. Portable book light. 4,598,340, Cl. 362-98.000.

E. R. Squibb & Sons, Inc.: *See*—
Gennaro, Gerald P.; and Haney, Paul S., 4,597,951, Cl. 423-2.000.
Karanewsky, Donald S., 4,598,071, Cl. 514-79.000.

Easco Corporation: *See*—
Bodnar, Michael L., 4,597,478, Cl. 192-43.100.

East/West Industries, Inc.: *See*—
Spinosa, Dominic J.; and Knoll, Frank, 4,597,498, Cl. 212-189.000.

Eastman Kodak Company: *See*—
Harvey, Donald M.; and Seely, Neil G., 4,597,654, Cl. 354-21.000.
Hilbert, Samuel D.; and McConnell, Richard L., 4,598,142, Cl. 528-295.000.
Reczek, James A., 4,598,020, Cl. 430-17.000.
Seely, Neil G.; and Harvey, Donald M., 4,597,653, Cl. 354-21.000.

Eaton Corporation: *See*—
Gale, Allan R.; and Gritter, David J., 4,598,240, Cl. 318-429.000.
Goscenski, Edward J., Jr., 4,597,746, Cl. 474-62.000.
Hicks, Bradford W.; Rolf, Jeffrey O.; and Valentine, Lewis J., 4,597,312, Cl. 74-695.000.
Lancaster, John B., 4,597,578, Cl. 273-81.00R.
Wenker, Wayne B., 4,597,476, Cl. 192-3.00R.

Ebisawa, Mikio: *See*—
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,597,913, Cl. 558-436.000.

Ecer, Gunes M., to CDP, Ltd. Conical cutters for drill bits, and processes to produce same. 4,597,456, Cl. 175-371.000.

Edwards, Brooks, to Polaroid Corporation. Method for acylating aminoanthraquinones. 4,597,905, Cl. 260-377.000.

Edwards, Clive: *See*—
Dwosh, Jack; and Edwards, Clive, 4,598,340, Cl. 362-98.000.

Edwards & Jones Limited: *See*—
Davis, Alan E., 4,597,862, Cl. 210-106.000.

Efimov, Andrei S.; Melnik, Igor M.; Tkachuk, Jury V.; Tronko, Nikolai D.; Efimova, Elena K.; Obrosova, Irina G.; Gordienko, Vadim M.; Kaminsky, Leonid A.; Stanimets, Vasily I.; Zborovsky, Jury L.; Mokhort, Nikolai A.; and Kirichek, Lora M., to Nauchno-Issledovatelsky Institut Endokrinologii I Obmena Veschestv; Nauchno-Issledovatelsky Institut Farmakologii I Toksikologii; and Institut Organicheckoi Khimii. 1,3-dioxo-1H-benz(de)isoquinoline-2(3H) butyric acid, pharmacologically acceptable salts thereof and compositions containing the same for treatment of diabetes mellitus complications. 4,598,081, Cl. 514-296.000.

Efimova, Elena K.: *See*—
Efimov, Andrei S.; Melnik, Igor M.; Tkachuk, Jury V.; Tronko, Nikolai D.; Efimova, Elena K.; Obrosova, Irina G.; Gordienko, Vadim M.; Kaminsky, Leonid A.; Stanimets, Vasily I.; Zborovsky, Jury L.; Mokhort, Nikolai A.; and Kirichek, Lora M., 4,598,081, Cl. 514-296.000.

Efron, Edward; McPherson, James O.; and Kim, Young B., to Discovision Associates. Audio evaluation under control of video picture frame number. 4,598,324, Cl. 358-341.000.

Egli, Rene ; and Staub, Hans-Rudolf, to Lonza Ltd. Process and apparatus for the superfine spraying of suspensions. 4,597,526, Cl. 239-123.000.

Eglise, David; and Horton, Edward C., to Mars Limited. Beverage dispensing machine. 4,597,506, Cl. 221-6.000.

Ehl, Klaus: *See*—
Uhrig, Heinz; Ehl, Klaus; and Deubel, Reinhold, 4,597,906, Cl. 260-401.000.

Ehret, Reiner: *See*—
Friemel, Wolfgang; and Ehret, Reiner, 4,597,218, Cl. 43-131.000.

Eichelberger, Charles W.: *See*—
Miller, Edward B.; and Eichelberger, Charles W., 4,598,286, Cl. 340-825.060.

Eida, Tsuyoshi: *See*—
Ohta, Tokuya; Yano, Yasuhiro; Matsufuji, Yohji; Haruta, Masahiro; and Eida, Tsuyoshi, 4,597,794, Cl. 106-20.000.

Eifler, Willi: *See*—
Keggenhoff, Berthold; Mahlmann, Enno; Eifler, Willi; and Ellendt, Gunther, 4,597,909, Cl. 560-347.000.

Eisai Co., Ltd.: *See*—
Ohwaki, Takayuki; Sakashita, Shigeru; Kawahara, Masahiro; Shinoda, Aishin; and Miyake, Yasuo, 4,598,070, Cl. 514-58.000.

Eisendrath, David C.: *See*—
Scheeler, Fred; and Eisendrath, David C., 4,597,705, Cl. 414-30.000.

Eisermann, Wolfgang M.: *See*—
Ostlinning, Edgar; Idel, Karsten; Eisermann, Wolfgang M.; and Freitag, Dieter, 4,598,144, Cl. 528-388.000.

Eisert, Manfred; and Grychtol, Klaus, to BASF Aktiengesellschaft. Basic colorants. 4,597,912, Cl. 558-403.000.

Elabd, Hammam; and Kosonocky, Walter F., to RCA Corporation. CCD imagers with registers partitioned for simultaneous charge transfers in opposing directions. 4,598,321, Cl. 358-213.000.

Eliades, Theo I., to Witco Corporation. One-step process for preparation of overbased calcium sulfonate greases and thickened compositions. 4,597,880, Cl. 252-33.400.

Ellenburg, Marvin L.: *See*—
Littlejohn, Robert J., 4,597,585, Cl. 280-411.00C.

Ellendt, Gunther: *See*—
Keggenhoff, Berthold; Mahlmann, Enno; Eifler, Willi; and Ellendt, Gunther, 4,597,909, Cl. 560-347.000.

Ellis, J. Scott: *See*—
Lax, Ronald G.; Johnson, Robert G.; Henningsen, Charles G.; and Ellis, J. Scott, 4,597,624, Cl. 339-143.00R.

Elmer, Stefan; and Forberger, Erich, to Schmid & Wezel. Band saw for cutting carcasses or the like. 4,597,132, Cl. 17-23.000.

Emco Wheaton International Limited: *See*—
Young, Colin G., 4,597,364, Cl. 123-27.0GE.

Emelock, Melvin. Hydrogen generator for motor vehicle. 4,597,363, Cl. 123-3.000.

Emery, Ralph E.: *See*—
Clark, Lloyd E.; and Emery, Ralph E., 4,598,179, Cl. 179-84.00C.

Emin, David: *See*—
Van Devender, John P.; and Emin, David, 4,598,338, Cl. 361-435.000.

ENDECO-Environmental Devices Corp.: *See*—
Brainard, Edward C., II, 4,597,351, Cl. 114-230.000.

Energy Conservation Partnership, Ltd.: *See*—
Johnson, Arthur F., 4,597,433, Cl. 165-4.000.

Energy Conversion Devices, Inc.: *See*—
Johnson, Robert R.; and Ovshinsky, Stanford R., 4,597,162, Cl. 29-574.000.
Nath, Prem; and Izu, Masatsugu, 4,598,306, Cl. 357-30.000.

Engel, Jurgen: *See*—
Schonenberger, Helmut; Wappes, Beate; Jennerwein, Margaretha; von Angerer, Erwin; and Engel, Jurgen, 4,598,091, Cl. 514-492.000.

English, George J.; Gagnon, Peter R.; and Leadváro, Stephen J., to GTE Products Corporation. Low wattage double filament tungsten-halogen lamp. 4,598,342, Cl. 362-213.000.

Enochs, Raymond S., to Tektronix, Inc. Pressure interconnect package for integrated circuits. 4,597,617, Cl. 339-17.0CF.

Entrekin, Stephen, to CryoLife, Inc. Freezing agent and container. 4,597,266, Cl. 62-46.000.

Environmental Elements Corp.: *See*—
VanHooser, William B.; and Williams, Robert J. W., 4,597,782, Cl. 55-378.000.

Eovine, Michael: *See*—
Faigen, Ivan; Eovine, Michael; and Thombs, David, 4,598,296, Cl. 343-730.000.

Epson Corporation: *See*—
Hoshikawa, Jun, 4,597,635, Cl. 350-334.000.

Equipements Automobiles Marshall: *See*—
Eustache, Jean-Pierre H.; and Maubray, Daniel L., 4,597,129, Cl. 15-250.160.

Ergun, Sabri; Schaleger, Larry L.; Wrathall, James A.; and Yaghoubzadeh, Nasser, to United States of America, Energy. Apparatus for converting biomass to a pumpable slurry. 4,597,832, Cl. 162-234.000.

Erickson Tool Company: *See*—
Ramunas, Valdas S., 4,597,699, Cl. 409-232.000.

Eriksson, Erik A., to Telefonaktiebolaget LM Ericsson. Telecommunication terminal. 4,598,172, Cl. 179-16.0AA.

Ernst, Hans-Hellmut: *See*—
Burghardt, Wilfried; Nilsson, Karl E.; and Ernst, Hans-Hellmut, 4,597,586, Cl. 280-806.000.

Ernst, Josef; and Semmler, Hans-Joachim, to Hoechst Aktiengesellschaft. One-component alkali metal silicate cement composition. 4,597,796, Cl. 106-74.000.

Esco Corporation: *See*—
Briscoe, Terry L.; and VanRaden, Rebecca A. H., 4,597,713, Cl. 414-690.000.

Esmieu, Jean-Paul, to Cegedur Societe de Transformation de l'Aluminium Pechiney. Process and apparatus for producing reinforced metal strips. 4,597,277, Cl. 72-182.000.

Essilor International (Compagnie Generale d'Optique): *See*—
Capo-Gual, Christine; Delattre, Luc; and Hennequin, Jean-Claude, 4,597,651, Cl. 351-243.000.
Pass, Michel, 4,597,647, Cl. 351-133.000.

Estabrook, Lawrence E.: *See—*
Quintana, Manuel E.; and Estabrook, Lawrence E., 4,597,773, Cl. 48-197.00R.

Etscorn, Frank T. Transcutaneous application of nicotine. 4,597,961, Cl. 424-28.000.

Etzell, Roger A.: *See—*
Wright, Howard J.; Leonard, David P.; and Etzell, Roger A., 4,598,111, Cl. 524-40.000.

Eustache, Jean-Pierre H.; and Maubray, Daniel L., to Equipements Automobiles Marshall. Windscreen wiper device. 4,597,129, Cl. 15-250.160.

Evans, Joseph P., to Porters Grove Metal Recovery Co., Inc. Metal recovery process. 4,597,842, Cl. 204-130.000.

Evans, Tery J.: *See—*
Cook, James W.; and Evans, Tery J., 4,598,186, Cl. 200-144.00R.

Eveland, Michael: *See—*
Cushman, Robert L.; Koester, Arlan; and Eveland, Michael, 4,597,525, Cl. 239-28.000.

Evenson, Edward, to Milton Industries, Inc. Air activated vacuum pump. 4,597,716, Cl. 417-181.000.

Exxon Research and Engineering Co.: *See—*
Billimoria, Rustom M.; and Tao, Frank F., 4,597,775, Cl. 48-197.00R.
Tiedje, J. Thomas; and Abeles, Benjamin, 4,598,164, Cl. 136-249.000.

Eymard, Michel, to Zodiac. Inflatable reservoir for containing a liquid, more especially an inflatable swimming pool, and a method for filling same. 4,597,113, Cl. 4-488.000.

F. W. Saybolt & Co. Inc.: *See—*
Joyce, Edward D., 4,597,562, Cl. 254-334.000.

Fabre, Jean; Lavalou, Eric; and Nicolas, Francois, to Aluminium Pechiney. Purification of solutions of sodium aluminate in the Bayer cycle by the removal of sodium oxalate. 4,597,952, Cl. 423-122.000.

Faessel, Andre : *See—*
Deroche, Raymond-Yves; Bourdon, Yves; and Faessel, Andre , 4,597,283, Cl. 72-378.000.

Faigen, Ivan; Eovine, Michael; and Thombs, David, to Chu Associates, Inc. Dipole antenna system with overhead coverage having equidirectional-linear polarization. 4,598,296, Cl. 343-730.000.

Fair, Donald G.; and Chetty, Pandipati R. K., to Sundstrand Corporation. Soft-start control for a push-pull converter-regulator with a flux balancing circuit. 4,598,351, Cl. 363-49.000.

Fairbanks, David W., to RCA Corporation. Apparatus for positioning a stylus. 4,597,646, Cl. 350-529.000.

Fairchild Camera & Instrument Corporation: *See—*
Kurtz, John A.; Cousens, Donald E.; and Dufour, Mark D., 4,597,519, Cl. 228-102.000.

Fajt, John: *See—*
Henning, Haden V.; Warthan, Jerry G.; and Fajt, John, 4,598,229, Cl. 313-493.000.

Falcon Jet Corporation: *See—*
Ryan, James M., 4,597,549, Cl. 244-118.500.

Falk, Roland: *See—*
Roller, Hermann; Hack, Joachim; Woweries, Uwe; Lehner, August; Grau, Werner; Nagel, Peter; and Falk, Roland, 4,597,990, Cl. 427-130.000.

Falke, Jurgen, to Behringwerke Aktiengesellschaft. Process for obtaining a factor XIII preparation, and its use. 4,597,899, Cl. 530-383.000.

Faraday, Robin C.: *See—*
Ciechanowski, Mark; and Faraday, Robin C., 4,597,551, Cl. 248-314.000.

Farmitalia Carlo Erba, S.p.A.: *See—*
Doria, Gianfederico; Passarotti, Carlo; and Buttinoni, Ada, 4,598,090, Cl. 514-455.000.

Farnham, William B.; Middleton, William J.; and Sogah, Dotsevi Y., to Du Pont de Nemours, E. I., and Company. Tris(dialkylamino)sulfonium bifluoride catalysts. 4,598,161, Cl. 564-101.000.

Faulkner, Dennis T.: *See—*
Shepler, John E.; Rinker, Douglas A.; Beneditz, Bruce D.; Vicari, John J.; and Faulkner, Dennis T., 4,598,355, Cl. 364-184.000.

Faulkner, George E.: *See—*
Fino, Jeffrey J.; and Faulkner, George E., 4,598,406, Cl. 372-59.000.

Fayfield, Robert W., to Banner Engineering Corp. Automatic power control for modulated LED photoelectric devices. 4,598,198, Cl. 250-205.000.

Feldman, Richard B., to Chevron Research Company. Water detection subassemblies and method of forming same, for use in computer processing centers. 4,598,277, Cl. 340-604.000.

Feldon, Steven E.; Broome, Barry G.; and Wallace, David A., to Keratometer Research and Development. Keratometer. 4,597,648, Cl. 351-212.000.

Fellman, Daniel J., to General Electric Company. Harmonic tuning system for radio receivers. 4,598,422, Cl. 455-180.000.

Felt Products Mfg. Co.: *See—*
Inciong, Josefino T.; and Miszczak, Frank L., 4,597,583, Cl. 277-235.00B.

Felten, John J., to Du Pont de Nemours, E. I., and Company. Photosensitive conductive metal composition. 4,598,037, Cl. 430-281.000.

Fenstermaker, Michael L.; and Pellman, Mark A., to Air Products and Chemicals, Inc. Accelerated carburizing method with discrete atmospheres. 4,597,807, Cl. 148-16.500.

Ferag AG: *See—*
Honegger, Werner, 4,597,243, Cl. 53-430.000.
Leu, Willy, 4,597,541, Cl. 242-55.000.

Fertig, Glenn H.; and Wozniak, Robert J., to Mine Safety Appliances Company. Infrared fluid analyzer employing a pneumatic detector. 4,598,201, Cl. 250-343.000.

Fiat Auto S.p.A.: *See—*
Cipolla, Giovanni, 4,597,264, Cl. 60-602.000.

Fichtel & Sachs Industries, Inc.: *See—*
Smith, Richard C., 4,597,565, Cl. 267-64.130.

Financial Design Systems, Inc.: *See—*
DeFrancesco, James; and Freiman, Scott L., 4,598,367, Cl. 364-408.000.

Finike Italiana Marposs S.p.A.: *See—*
Golinelli, Guido; and Possati, Mario, 4,597,184, Cl. 33-143.00F.

Finkl, Charles W. Trimming arrangement for planing hulls. 4,597,742, Cl. 440-61.000.

Fino, Jeffrey J.; and Faulkner, George E., to Texas Instruments Incorporated. Pressure-wave cycled, repetitively pulsed gas laser. 4,598,406, Cl. 372-59.000.

Firan Corporation: *See—*
Tadros, Jehane, 4,597,828, Cl. 156-643.000.

First Amsterdam Corp.: *See—*
Sumner, Samuel, 4,597,117, Cl. 5-181.000.

Fischer, Frederick H.; Murphy, Edmond J.; and Rice, Trudie C., to AT&T Bell Laboratories. Formation of features in optical material. 4,598,039, Cl. 430-323.000.

Fischer, Manfred: *See—*
Neuhauser, Hans J.; Buran, Ulrich; Fischer, Manfred; and Beyer, Horst, 4,597,939, Cl. 420-429.000.

Fisher, John: *See—*
Perry, Frederick G.; and Fisher, John, 4,598,097, Cl. 514-738.000.

Fister, Louis P.; Fitch, Lawrence H.; and Pearson, Herby O., to Moog Automotive, Inc. Method of and apparatus for closing joint devices to obtain consistent torque values. 4,597,150, Cl. 29-407.000.

Fitch, Lawrence H.: *See—*
Fister, Louis P.; Fitch, Lawrence H.; and Pearson, Herby O., 4,597,150, Cl. 29-407.000.

FL Industries, Inc.: *See—*
Peppers, James E., 4,598,347, Cl. 362-373.000.

Flavell, David J.: *See—*
Garnjost, Kenneth D.; and Flavell, David J., 4,597,322, Cl. 92-60.000.

Fletcher, Daniel G.: *See—*
Karbassiyoon, Kamran; Akers, Francis I.; Raplee, Larry J.; and Fletcher, Daniel G., 4,597,785, Cl. 65-2.000.

Fleury Michon: *See—*
Fonteneau, Jean L.; and Germon, Jean P., 4,597,974, Cl. 426-129.000.

Flex-o-lators, Inc.: *See—*
Scrivner, Jerry G., 4,597,566, Cl. 267-91.000.

Flexivol, Inc.: *See—*
Apffel, Fred P., 4,597,788, Cl. 62-26.000.

Flores, Arnold, to United States of America, Navy. Printed circuit card hybrid. 4,597,631, Cl. 350-96.200.

FMC Corporation: *See—*
Jones, Charles E.; and Brabant, Bette-Jean, 4,597,889, Cl. 252-135.000.

Focht, Marlin W.: *See—*
Capasso, Federico; Focht, Marlin W.; Macrander, Albert T.; and Schwartz, Bertram, 4,597,165, Cl. 29-576.00B.

Fock, Jurgen, to Th. Goldschmidt AG. Process for the preparation of polyesters of improved dye affinity. 4,598,141, Cl. 528-293.000.

Fogel, Isaac; and Keefer, Donald W., to Classic Corporation. Waterbed utilizing dual fluid-filled mattresses and having improved surface continuity. 4,597,120, Cl. 5-451.000.

Fohl, Artur, to TRW Repa GmbH. Safety belt retractor. 4,597,544, Cl. 242-107.40B.

Fontanille, Daniel, to Stein Industrie. Method and apparatus for regulating the operation of a crusher. 4,597,535, Cl. 241-30.000.

Fonteneau, Jean L.; and Germon, Jean P., to Fleury Michon. Sauce and gravy compositions. 4,597,974, Cl. 426-129.000.

Forand, Joseph T.; and Hellyer, James A., to Procter & Gamble Company, The. Coal-water slurry compositions. 4,597,770, Cl. 44-51.000.

Forberger, Erich: *See—*
Elmer, Stefan; and Forberger, Erich, 4,597,132, Cl. 17-23.000.

Ford Aerospace & Communications Corporation: *See—*
Anderson, David A. K.; Gilpin, James B.; and Kniffin, Melvin J., 4,597,175, Cl. 29-827.000.

Ford, John R., to Vernay Laboratories, Inc. Early warning of marine cooling system failure. 4,598,278, Cl. 340-608.000.

Ford, Michael E.; and Johnson, Thomas A., to Air Products and Chemicals, Inc. Production of amino aliphatic and cycloaliphatic hydrogen sulfates. 4,597,911, Cl. 558-29.000.

Ford Motor Company: *See—*
Stockton, Thomas R., 4,597,467, Cl. 180-248.000.
Tarpley, Gerald W., Jr.; and Bardon, Anne M., 4,597,547, Cl. 242-191.000.
Vogt, Hans; and Spiegel, Erwin, 4,598,008, Cl. 428-117.000.

Forgac, John M.: *See—*
York, Earl D.; Knepper, Jay C.; and Forgac, John M., 4,597,852, Cl. 208-427.000.

Forkel, Michael; Dallwig, Claus; and Volk, Hans-Joachim, to Brose Fahrzeugteile GmbH & Co. KG. Arrangement for locking an entrainment member for a safety belt. 4,597,607, Cl. 297-468.000.

Forrest, Scott M., to Marin Tek, Inc. Fast cycle water vapor cryopump. 4,597,267, Cl. 62-55.500.

Forster, Denis; Schaefer, George F.; and Barker, George E., to Monsanto Company. Detergent range aldehyde and alcohol mixtures and derivatives, and process therefor. 4,598,162, Cl. 568-448.000.
Forster, Hans-Joachim, to Daimler-Benz AG. Active switch. 4,597,336, Cl. 104-130.000.
Forster, Rolf: *See—*
Sander, Gunter; and Forster, Rolf, 4,597,738, Cl. 433-7.000.
Fortel Corporation: *See—*
Hanscom, Bradford E.; and Mock, Gerald L., 4,598,171, Cl. 179-6.140.
Fosco, Benjamin P., Jr. Bottle warmer or cooler. 4,597,435, Cl. 165-80.500.
Foster Wheeler Energy Corporation: *See—*
Garcia-Mallol, Juan A.; and Sinn, Brian T., 4,597,774, Cl. 48-197.00R.
Fournier, James L. Light weight tent. 4,597,401, Cl. 135-90.000.
Framatome & Cie: *See—*
Verdeau, Jean-Jacques; and Le Helloco, Michel R., 4,597,935, Cl. 376-353.000.
Francis, Alex W., Jr. deceased, to Combustion Engineering, Inc. Treatment of oil well production. 4,597,874, Cl. 210-708.000.
Francotyp-Postalia GmbH: *See—*
Lembens, Helmut, 4,597,329, Cl. 101-363.000.
Frandsen, Erik K.: *See—*
Lundi, Behrend F.; Jorgensen, Karin D.; Johansen, Nils L.; Gronvald, Frederik C.; Frandsen, Erik K.; Moody, Alister J.; and Markussen, Jan, 4,598,065, Cl. 514-12.000.
Frangesh, Thomas P., to Xerox Corporation. Mechanical damper for disk drives having band drive actuators. 4,598,328, Cl. 360-97.000.
Frank, Gerhard; Neubauer, Gerald; Duffner, Paul; and Wilfinger, Hans J., to BASF Aktiengesellschaft. Molded catalyst materials containing reduced cobalt and/or nickel particles. 4,598,058, Cl. 502-183.000.
Frank, Hans-Eberhard; and Petrizza, Norbert, to Maschinenfabrik Diedesheim GmbH. Machine tool. 4,597,144, Cl. 29-40.000.
Franklin Electric Co., Inc.: *See—*
Weihsmann, Peter R., 4,597,555, Cl. 248-672.000.
Freeouf, John L.; Jackson, Thomas N.; Oelhafen, Peter; Pettit, George D.; and Woodall, Jerry M., to International Business Machines Corporation. Intermediate passivation and cleaning of compound semiconductor surfaces. 4,597,825, Cl. 156-643.000.
Freiberg, Klaus; and Muller, Hans. Condenser lens system for microscopes. 4,597,645, Cl. 350-526.000.
Freiman, Scott L.: *See—*
DeFrancesco, James; and Freiman, Scott L., 4,598,367, Cl. 364-408.000.
Freitag, Dieter: *See—*
Ostlinning, Edgar; Idel, Karsten; Eisermann, Wolfgang M.; and Freitag, Dieter, 4,598,144, Cl. 528-388.000.
Frerichs, Udo: *See—*
Mauk, Gerhard; Huinink, Heinrich; Seitz, Hans; Frerichs, Udo; Rach, Heinz-Dieter; and Poque , Dionysius, 4,597,426, Cl. 152-379.500.
Friedman, Joseph: *See—*
Ullman, Alan Z.; Silverman, Jacob; and Friedman, Joseph, 4,597,776, Cl. 48-197.00R.
Friedrich, Karl, to Kramer-Werke GmbH. Compact industrial vehicle. 4,597,468, Cl. 180-255.000.
Friedrichs, Bernd: *See—*
Wilke, Rudolf; and Friedrichs, Bernd, 4,597,600, Cl. 292-336.300.
Friedrichs, Ingo H. Cleaning apparatus for the wet cleaning of building walls and floors, swimming pools, automobiles and the like. 4,597,720, Cl. 417-368.000.
Friemel, Wolfgang; and Ehret, Reiner, to Dr. Werner Freyberg. Sachet for use in pest control. 4,597,218, Cl. 43-131.000.
Fritschi, Edgar: *See—*
Barth, Hubert; Fritschi, Edgar; Ganser, Volker; Hartenstein, Johannes; Herrmann, Manfred; and Satzinger, Gerhard, 4,598,076, Cl. 514-230.000.
Fuchs, Wilfried: *See—*
Zaschke, Horst; Vorbrodt, Hans-Matthias; Fuchs, Wilfried; Wiegeleben, Adelbert; and Demus, Dietrich, 4,597,892, Cl. 252-299.610.
Fuji Photo Film Co., Ltd.: *See—*
Hara, Yoshio; and Ishino, Yoshiaki, 4,598,041, Cl. 430-498.000.
Ichikawa, Haruo, 4,597,316, Cl. 83-156.000.
Iwasaki, Masayuki; Maeda, Minoru; Shinozaki, Fumiaki; and Ishige, Sadao, 4,598,036, Cl. 430-270.000.
Kawakami, Chikuni, 4,598,243, Cl. 323-349.000.
Kawamura, Kouichi; Horie, Seiji; Makino, Naonori; and Sato, Hideo, 4,598,033, Cl. 430-75.000.
Miyoshi, Takahito; Masuyama, Kenichi; Okutu, Toshimitu; Utumi, Masahiro; Fujiyama, Masaaki; and Kanazawa, Minoru, 4,598,014, Cl. 428-323.000.
Oda, Kazutaka; Kon, Yoshio; and Kakei, Tsutomu, 4,597,837, Cl. 204-14.100.
Ohta, Takahiro, 4,597,637, Cl. 350-339.00F.
Shirai, Hiroshi; and Matsuhisa, Tsuneyasu, 4,597,533, Cl. 239-701.000.
Taniguchi, Yutaka, 4,598,200, Cl. 250-327.200.
Usami, Toshimasa; and Tanaka, Toshiharu, 4,598,035, Cl. 430-138.000.
Yamashita, Yoshimi, 4,597,656, Cl. 354-193.000.
Fuji Photo Optical Co., Ltd.: *See—*
Itamoto, Shigeru; Suzuki, Kiyoshi; and Yasuda, Kenji, 4,597,569, Cl. 269-21.000.
Fuji Xerox Co., Ltd.: *See—*
Leng, Svay; Suganuma, Saburo; and Kataoka, Hiroyuki, 4,597,660, Cl. 355-3.0SH.
Fujii, Ray K.; and Brown, William K. Pivoted grip ski pole. 4,597,589, Cl. 280-821.000.
Fujii, Setsuro; Sato, Takuo; Kawamura, Hiroyuki; Yaegashi, Takashi; Kurumi, Masateru; and Aoyama, Takuo, to Torii & Co. Ltd. Amidine derivatives and cardiotonic compositions. 4,598,077, Cl. 514-233.000.
Fujii, Tadashi; and Hayakawa, Yoshinori, to Terumo Corporation, by said Tadashi Fujii. Ultrasonic measurement method and apparatus therefor. 4,597,292, Cl. 73-599.000.
Fujimura, Setsuo: *See—*
Matsuura, Yutaka; Sagawa, Masato; and Fujimura, Setsuo, 4,597,938, Cl. 419-23.000.
Fujioka, Atsushi; Miyadera, Yasuo; and Fukuda, Tomio, to Hitachi Chemical Company, Ltd. Polyamino-bis-maleimide prepolymer, method for manufacture thereof, and method for manufacture of laminate using said prepolymer. 4,598,115, Cl. 524-376.000.
Fujisaki, Hideaki; Nieda, Seiichi; and Tsunemitsu, Katsuhiko, to Yamada Chemical Co. Ltd. Chromogenic 1-(3-methoxy-4-alkoxyphenyl)-2-(2'-quinolyl)ethylene compounds. 4,598,150, Cl. 546-152.000.
Fujisawa Pharmaceutical Co., Ltd.: *See—*
Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tsuji, Kiyoshi, 4,598,147, Cl. 544-238.000.
Fujita, Hironori: *See—*
Tachikawa, Hideo; Suzuki, Takatoshi; Fujita, Hironori; and Arai, Tohru, 4,597,808, Cl. 148-20.300.
Fujitsu Limited: *See—*
Ikegami, Yoshiki; and Sato, Yasuaki, 4,598,284, Cl. 340-750.000.
Imaoka, Kazunori, 4,597,804, Cl. 148-1.500.
Majima, Teiji; and Watanabe, Hiromichi, 4,597,826, Cl. 156-643.000.
Matsumoto, Toshio; and Kato, Motokazu, 4,598,402, Cl. 371-38.000.
Saito, Toshiyuki; Okubo, Naofumi; Kaneko, Yoshiaki; and Tokumitsu, Yasuyuki, 4,598,254, Cl. 330-286.000.
Wakabayashi, Tetsushi; and Muratake, Kiyoshi, 4,598,307, Cl. 357-75.000.
Fujitsuka, Nobuyoshi: *See—*
Ohashi, Hiromu; Suzuka, Masakazu; Murata, Yukio; and Fujitsuka, Nobuyoshi, 4,597,670, Cl. 356-405.000.
Fujiyama, Masaaki: *See—*
Miyoshi, Takahito; Masuyama, Kenichi; Okutu, Toshimitu; Utumi, Masahiro; Fujiyama, Masaaki; and Kanazawa, Minoru, 4,598,014, Cl. 428-323.000.
Fukami, Takeshi: *See—*
Komatsubara, Michimasa; Fukami, Takeshi; Sakamoto. Akira; Sugita, Takehiro; and Miyata, Toshiya, 4,598,169, Cl. 178-22.040.
Fukase, Satoshi: *See—*
Yoshioka, Susumu; Matsuo, Nobuo; Meguri, Nobuyasu; Murakami, Tadashi; Ishibashi, Yasushi; Matsuda, Kenichi; Suzuka, Teruo; Fukase, Satoshi; and Ohse, Hidetaka, 4,597,856, Cl. 208-112.000.
Fukazawa, Takao: *See—*
Koike, Takahisa; Fukazawa, Takao; Ishima, Kazumi; Murai, Toshiharu; Itoh, Tadashi; Kato, Toshifumi; and Jinnai, Koichiro, 4,598,299, Cl. 346-75.000.
Fukuda, Shinichi, to Sony Corporation. Method and apparatus for converting a digital signal. 4,598,267, Cl. 340-347.0DD.
Fukuda, Tomio: *See—*
Fujioka, Atsushi; Miyadera, Yasuo; and Fukuda, Tomio, 4,598,115, Cl. 524-376.000.
Fukumoto, Ryoichi: *See—*
Shiraishi, Daiichi; Iwasaki, Eiji; and Fukumoto, Ryoichi, 4,597,223, Cl. 49-352.000.
Fukuyama, Kyosuke: *See—*
Misaka, Takaaki; Furukawa, Takeshi; Onuma, Eiichi; Obana, Hiroshi; Fukuyama, Kyosuke; Tanaka, Toshiyuki; Murata, Hiroyuki; and Shimojima, Katuhiko, 4,597,537, Cl. 241-79.100.
Fukuyasu, Harumi: *See—*
Nishimura, Tantio; Toku, Hiroshige; Yoshii, Shin; Fukuyasu, Harumi; Matsumoto, Kuniomi; Kazuno, Youzo; and Watanabe, Tetsuro, 4,598,095, Cl. 514-632.000.
Fulet Electronic Industrial Company: *See—*
Hong, Min-Tai, 4,598,255, Cl. 330-297.000.
Fure, Barbara J.: *See—*
Jenekhe, Samson A.; and Fure, Barbara J., 4,598,139, Cl. 528-248.000.
Furukawa, Mitsuhiko: *See—*
Wada, Toshiaki; Furukawa, Mitsuhiko; Nagano, Mitsuyoshi; Miyahara, Michito; and Mori, Shigeki, 4,598,052, Cl. 501-87.000.
Furukawa, Takeshi: *See—*
Misaka, Takaaki; Furukawa, Takeshi; Onuma, Eiichi; Obana, Hiroshi; Fukuyama, Kyosuke; Tanaka, Toshiyuki; Murata, Hiroyuki; and Shimojima, Katuhiko, 4,597,537, Cl. 241-79.100.
Furukawa, Yasuharu, to Toyota Jidosha Kabushiki Kaisha. Oil separator for blowby gas. 4,597,372, Cl. 123-572.000.
Furukawa, Yoshimi: *See—*
Sano, Shoichi; and Furukawa, Yoshimi, 4,597,462, Cl. 180-140.000.
Fussell, Charles H. Image reception system. 4,597,633, Cl. 350-125.000.
G. D. Societa Per Azioni: *See—*
Mattei, Riccardo; and Gamberini, Antonio, 4,597,246, Cl. 53-542.000.
GA Technologies Inc.: *See—*
Kane, James L., 4,597,936, Cl. 376-411.000.

Gabbard, Larry J.; and Gorenz, Henry J., Jr. Key block arrangement. 4,597,626, Cl. 339-184.00M.

Gabelish, Peter W.; Vial, Albany R.; and Roberts, Russell W. Rotary valve. 4,597,321, Cl. 91-470.000.

Gadenz, Renato N.: *See—*
Boddie, James R.; Gadenz, Renato N.; and Thompson, John S., 4,598,358, Cl. 364-200.000.

Gagnon, Peter R., to GTE Products Corporation. Electric lamp with high outer-envelope to inner-envelope wall-thickness ratio. 4,598,225, Cl. 313-17.000.

Gagnon, Peter R.: *See—*
English, George J.; Gagnon, Peter R.; and Leadvaro, Stephen J., 4,598,342, Cl. 362-213.000.

Gaia, Franco, to BBC Brown, Boveri & Company, Ltd. Process and equipment for water treatment. 4,597,877, Cl. 210-750.000.

Galbraith, Lee K.; and Urbanek, Karel, to Tencor Instruments. Dual collector optical flaw detector. 4,597,665, Cl. 356-237.000.

Gale, Allan R.; and Gritter, David J., to Eaton Corporation. Self synchronous motor sensor switching arrangement. 4,598,240, Cl. 318-429.000.

Galileo Electro-Optics Corp.: *See—*
Beuscher, Clinton J., 4,598,018, Cl. 428-389.000.

Galloup, Clifford L.; and Stack, Paul D., Jr., to Cooper Industries, Inc. Bit driving attachment for conductor wrapping tool. 4,597,419, Cl. 140-124.000.

Gamberini, Antonio: *See—*
Mattei, Riccardo; and Gamberini, Antonio, 4,597,246, Cl. 53-542.000.

Gandhi, Deepak R.: *See—*
Samson, Wilfred J.; and Gandhi, Deepak R., 4,597,755, Cl. 604-96.000.

Ganguli, Keshab L.: *See—*
Lok, Cornelis M.; and Ganguli, Keshab L., 4,597,908, Cl. 260-409.000.

Ganser, Volker: *See—*
Barth, Hubert; Fritschi, Edgar; Ganser, Volker; Hartenstein, Johannes; Herrmann, Manfred; and Satzinger, Gerhard, 4,598,076, Cl. 514-230.000.

GAO Gesellschaft fur Automation und Organisation mbH: *See—*
Kaule, Wittich; and Stenzel, Gerhard, 4,598,205, Cl. 250-458.100.
Maurer, Thomas, 4,597,593, Cl. 283-91.000.

Garcia-Mallol, Juan A.; and Sinn, Brian T., to Foster Wheeler Energy Corporation. Method for improving the operation of a fluidized bed. 4,597,774, Cl. 48-197.00R.

Gardner, Jeffrey B.; Kuiper, Gerald J.; and Nelson, Richard A., to Square D Company. Trip indicating circuit breaker operating handle. 4,598,183, Cl. 200-50.00A.

Gardner, Ralph F. Impact crushing device. 4,597,327, Cl. 100-295.000.

Garlinghouse, Randy. Remote control engine starter. 4,598,209, Cl. 290-38.00C.

Garnett, Donald W.; and Watson, John A., to Olofsson Corporation, The. Boring machine with work-handling tool turret. 4,597,155, Cl. 29-564.000.

Garnjost, Kenneth D.; and Flavell, David J., to Moog Inc. Seal assemblies. 4,597,322, Cl. 92-60.000.

Garrett Corporation, The: *See—*
Daudet, Howard C.; and Bagley, Weldon D., 4,597,362, Cl. 122-4.00D.
Maertins, Hans F. W.; Mays, James C.; and Corrigan, Charles E., 4,597,675, Cl. 374-115.000.

Garrett, John E. Electrically heated handle for fishing rods. 4,598,192, Cl. 219-201.000.

Gassie, Jon M. Poison dart. 4,597,580, Cl. 273-418.000.

Gatto, Vincent J.: *See—*
Gokel, George W.; and Gatto, Vincent J., 4,597,903, Cl. 260-330.600.

Gaudiana, Russell A.: *See—*
Rogers, Howard G.; Gaudiana, Russell A.; McGowan, Cynthia B.; Norland, Kenneth S.; and Sahatjian, Ronald J., 4,597,891, Cl. 252-299.100.

Gaylord, F. David; and Wickersheimer, Jack C., to MagneTek, Inc. Submersible motor. 4,598,219, Cl. 310-87.000.

Gaymar Industries, Inc.: *See—*
Whitney, John K., 4,597,384, Cl. 128-24.00R.

Gebruder Buhler AG: *See—*
Oetiker, Hans; and Kummer, Emanuel, 4,597,405, Cl. 137-14.000.

GEC Mechanical Handling Limited: *See—*
Mitchell, Keith J.; Barber, Norman R.; and Ward, Michael, 4,597,689, Cl. 403-322.000.

Gehm, Robert: *See—*
Horn, Peter; Bunsch, Hellmut; Gehm, Robert; and Marx, Matthias, 4,598,125, Cl. 525-183.000.

Geissler, Robert G.; and D'Elio, Carmine, to Ortech Electronics Inc. Secure video distribution systems. 4,598,312, Cl. 358-118.000.

Gelula, Jerome D. Coupling system with lock. 4,597,354, Cl. 114-343.000.

Gendron, Wilfred H.; and Knapp, Frank T., to Westvaco Corporation. Envelope with concealed message window. 4,597,591, Cl. 283-1.00B.

General Electric Company: *See—*
Benjamin, John L.; and Van Dell, William R., 4,597,822, Cl. 156-612.000.
Borman, Willem F. H.; and Campbell, Richard W., 4,598,129, Cl. 525-439.000.
Buese, Mark A., 4,598,135, Cl. 528-23.000.
Fellman, Daniel J., 4,598,422, Cl. 455-180.000.
Germer, Warren R., 4,598,248, Cl. 324-103.00R.
Haitko, Deborah A., 4,598,140, Cl. 528-215.000.
Howell, Edward K., 4,598,187, Cl. 200-147.00R.
Jansma, Jon B., 4,597,984, Cl. 427-28.000.
Liu, Nan-I; and McCready, Russell J., 4,598,117, Cl. 524-444.000.
Miller, Edward B.; and Eichelberger, Charles W., 4,598,286, Cl. 340-825.060.
Moore, James E., 4,598,021, Cl. 428-412.000.
Murphy, Harold R., 4,598,295, Cl. 343-702.000.
Vohr, John H.; Miller, William H.; and Perkins, Jeffrey J., 4,597,676, Cl. 384-114.000.

General Instrument Corporation: *See—*
Robbins, Clyde N., 4,598,318, Cl. 358-124.000.

General Machine Design, Inc.: *See—*
Cornacchia, Vincent, 4,597,707, Cl. 414-62.000.

General Motors Corporation: *See—*
Ament, Frank, 4,597,368, Cl. 123-339.000.
Cataldo, Roy S., 4,597,304, Cl. 74-329.000.
Kochy, Fritz; Brandel, Klaus; Hullmann, Horst; Neumann, Bernhard; and Helmsing, Gerhard, 4,597,461, Cl. 180-90.000.
Madaffer, Anthony J., 4,597,365, Cl. 123-90.600.
Sherman, James F., 4,597,313, Cl. 74-861.000.
Trabert, Hans-Gerhard, 4,597,603, Cl. 296-194.000.
Zaydel, Wieslaw S., 4,597,153, Cl. 29-434.000.

General Screw Products Company: *See—*
Nimberger, Spencer M., 4,597,581, Cl. 277-12.000.

Genex Corporation: *See—*
McGuire, Jeffrey C., 4,598,047, Cl. 435-108.000.

Gennaro, Gerald P.; and Haney, Paul S., to E. R. Squibb & Sons, Inc. Strontium-82/rubidium-82 generator. 4,597,951, Cl. 423-2.000.

Gentischer, Josef; and Rudolf, Boris, to C. & E. Fein GmbH & Co. Device for attaching a tool. 4,597,227, Cl. 51-168.000.

Geoff. Williames (Aust.) Pty. Ltd.: *See—*
Williames, Geoffrey A., 4,597,252, Cl. 56-130.000.

Georgia Tech Research Institute: *See—*
Steenblik, Richard A., 4,597,634, Cl. 350-144.000.

Gerber, Hermann E.; and Ulfers, Bernard G., to United States of America, Navy. Apparatus for determining the liquid water content of a gas. 4,597,666, Cl. 356-338.000.

Gerber Products Company: *See—*
Conklin, Glenn T., 4,597,491, Cl. 198-642.000.

Germer, Warren R., to General Electric Company. Test operation of electronic demand register. 4,598,248, Cl. 324-103.00R.

Germon, Jean P.: *See—*
Fonteneau, Jean L.; and Germon, Jean P., 4,597,974, Cl. 426-129.000.

Gesell, Reinhard: *See—*
Angelbeck, Rolf; Gesell, Reinhard; and Goessner, Matthias, 4,597,678, Cl. 384-452.000.

Getz, Roland A. Asphalt comminuting apparatus. 4,597,538, Cl. 241-86.100.

Giacomo, Harlan R., to H.R. Electronics Company. Management information system and associated vending control device. 4,598,378, Cl. 364-479.000.

Giese, Leonard R.: *See—*
Shields, Charles E.; and Giese, Leonard R., 4,597,176, Cl. 29-829.000.

Gieseke, Steven S., to Donaldson Company, Inc. Integrated lever and live spring valve. 4,597,415, Cl. 137-875.000.

Gilbert, Robert W. Combined tote bag and seat cushion. 4,597,605, Cl. 297-219.000.

Gillette Company, The: *See—*
Nelson, Robert E., 4,598,206, Cl. 250-495.100.

Gilmore, Jane F.: *See—*
Bottom, Carey B.; Gilmore, Jane F.; and Martin, John L., Jr., 4,597,941, Cl. 422-37.000.

Gilmour, Richard J.: *See—*
Chino, John J.; Swayne, David S.; and Gilmour, Richard J., 4,597,173, Cl. 29-741.000.

Gilpin, James B.: *See—*
Anderson, David A. K.; Gilpin, James B.; and Kniffin, Melvin J., 4,597,175, Cl. 29-827.000.

Girard Development Incorporated: *See—*
Girard, Donald A., 4,597,140, Cl. 24-569.000.
Girard, Donald A., 4,597,690, Cl. 403-391.000.

Girard, Donald A., to Girard Development Incorporated. Tube clamp. 4,597,140, Cl. 24-569.000.

Girard, Donald A., to Girard Development Incorporated. Tube clamps. 4,597,690, Cl. 403-391.000.

Girvan, Edward J.: *See—*
Baldauf, Lawrence M.; Girvan, Edward J.; Overfield, Richard B.; and Roberts, Gilbert C., 4,597,177, Cl. 29-878.000.

Glaenzer Spicer: *See—*
Orian, Michel A., 4,597,745, Cl. 464-173.000.

Glasurit America, Inc.: *See—*
Wright, Howard J.; Leonard, David P.; and Etzell, Roger A., 4,598,111, Cl. 524-40.000.

Glauser, Rolf: *See—*
Collins, Jerry C.; Warner, Charles P.; Henkener, Jerry A.; and Glauser, Rolf, 4,598,290, Cl. 340-850.000.

Glaverbel: *See—*
Van Laethem, Robert; Van Cauter, Albert; and Terneu, Robert, 4,598.023, Cl. 428-432.000.

Glennon, Timothy F.; and Reynolds, Richard W., to Sundstrand Corporation. End turn construction for dynamoelectric machines. 4,598,223, Cl. 310-260.000.

Glitsch, Inc.: *See*—
Chen, Gilbert, 4,597,916, Cl. 261-94.000.
Glyco Antriebs Technick GmbH: *See*—
Porel, Louis-Claude; and Cyphelly, Ivan, 4,597,483, Cl. 192-59.000.
Godding, Patrick N.: *See*—
Nelson, Gary A.; and Godding, Patrick N., 4,598,397, Cl. 370-110.100.
Goedhart, Machiel; Gortemaker, Franciscus H.; Kemper, Hermanus C.; and Kielman, Hendrik S., to Lever Brothers Company. Dishwashing compositions. 4,597,886, Cl. 252-95.000.
Goessner, Matthias: *See*—
Angelbeck, Rolf; Gesell, Reinhard; and Goessner, Matthias, 4,597,678, Cl. 384-452.000.
Goetze AG: *See*—
Neuhauser, Hans J.; Buran, Ulrich; Fischer, Manfred; and Beyer, Horst, 4,597,939, Cl. 420-429.000.
Goforth, Sidney. Component lead processor trimming and forming tool. 4,597,179, Cl. 30-233.000.
Goglanian, Alexander. Method of preparing perforated pita bread. 4,597,979, Cl. 426-496.000.
Gokel, George W.; and Gatto, Vincent J., to University of Maryland. Process for the direct preparation of N,N-disubstituted derivatives for 4,13-diaza-18-crown-6. 4,597,903, Cl. 260-330.600.
Goldenberg, Merrill, to Ciba-Geigy Corporation. Polyoxirane cross-linked polyvinyl alcohol hydrogel contact lens. 4,598,122, Cl. 525-61.000.
Golder, Willis E.: *See*—
Staples, Robert E.; Ierardi, Joseph A.; and Golder, Willis E., 4,598,246, Cl. 324-73.0PC.
Goldstein, Morton I. Lumbar support system. 4,597,386, Cl. 128-78.000.
Goldwell GmbH, Chemische Fabrik H. F. Dotter: *See*—
Wittersheim, Adam; and Much, Gunter, 4,597,683, Cl. 401-4.000.
Golike, Ralph C., to Du Pont de Nemours, E. I., and Company. Shrink films of ethylene/α-olefin copolymers. 4,597,920, Cl. 264-22.000.
Golinelli, Guido; and Possati, Mario, to Finike Italiana Marposs S.p.A. Snap gauge for checking dimensions of workpieces. 4,597,184, Cl. 33-143.00F.
Gonda, Michihiro: *See*—
Sensui, Hideyuki; Suzuka, Susumu; Gonda, Michihiro; and Kikkawa, Katsumasa, 4,597,795, Cl. 106-21.000.
Gontowski, Walter S., Jr., to Sprague Electric Company. Stable frequency sawtooth oscillator. 4,598,259, Cl. 331-111.000.
Goodman, Alvin M.: *See*—
Goodman, Lawrence A.; Goodman, Alvin M.; and Gossenberger, Herman F., 4,598,249, Cl. 324-158.00R.
Goodman, Lawrence A.; Goodman, Alvin M.; and Gossenberger, Herman F., to RCA Corporation. Method using surface photovoltage (SPV) measurements for revealing heavy metal contamination of semiconductor material. 4,598,249, Cl. 324-158.00R.
Goodman, Robert B., to United Technologies Corporation. Fluid actuator slew rate control. 4,597,319, Cl. 91-27.000.
Goodyear Tire & Rubber Company, The: *See*—
Tloczynski, James J.; Budzol, Melvin; Ahola, Clifford J.; and Rine, James C., 4,597,536, Cl. 241-62.000.
Goossens, Carolus C.: *See*—
Buelens, Edward; and Goossens, Carolus C., 4,597,658, Cl. 354-275.000.
Gordienko, Vadim M.: *See*—
Efimov, Andrei S.; Melnik, Igor M.; Tkachuk, Jury V.; Tronko, Nikolai D.; Efimova, Elena K.; Obrosova, Irina G.; Gordienko, Vadim M.; Kaminsky, Leonid A.; Staninets, Vasily I.; Zborovsky, Jury L.; Mokhort, Nikolai A.; and Kirichek, Lora M., 4,598,081, Cl. 514-296.000.
Gorenz, Henry J., Jr.: *See*—
Gabbard, Larry J.; and Gorenz, Henry J., Jr., 4,597,626, Cl. 339-184.00M.
Gorog, Sandor: *See*—
Toth, Edit; Torley, Jozsef; Palosi, Eva; Szebereneyi, Szabolcs; Szporny, Laszlo ; Gorog, Sandor; and Hajdu, Istvan, 4,598,080, Cl. 514-277.000.
Gortemaker, Franciscus H.: *See*—
Goedhart, Machiel; Gortemaker, Franciscus H.; Kemper, Hermanus C.; and Kielman, Hendrik S., 4,597,886, Cl. 252-95.000.
Goscenski, Edward J., Jr., to Eaton Corporation. Fan drive system for transverse engine. 4,597,746, Cl. 474-62.000.
Gossenberger, Herman F.: *See*—
Goodman, Lawrence A.; Goodman, Alvin M.; and Gossenberger, Herman F., 4,598,249, Cl. 324-158.00R.
Goto, Shigeru; and Sekiguchi, Toshio, to Yokogawa Hokushin Electric Corporation. Electromagnetic flowmeter. 4,597,295, Cl. 73-861.170.
Goudriaan, Frans; Hake, Timothy S.; Ladeur, Peter; Moureaux, Patrique; Saint, Jean-Paul; and van Dijk, Nicolaas, to Shell Oil Company. Process for the in situ fluorination of a catalyst. 4,598,059, Cl. 502-228.000.
Goudy, Paul R., Jr.; Doolittle, William P.; Jenkins, Thomas E.; Beemster, Bernard J.; Roos, William N.; and Collins, Patrick V., to Autotrol Corporation. Fluid diffuser. 4,597,530, Cl. 239-452.000.
Goupil, Dennis W.; and Musolino, Mary T., to American Cyanamid Company. Enhanced bulk porosity of polymer structures via plasma technology. 4,597,843, Cl. 204-165.000.
Graham, John W.; and Sinclair, A. Richard. Method for producing heat curable particles. 4,597,991, Cl. 427-214.000.
Graham, Tommy E., to Monsanto Company. Membrane gas separation processes. 4,597,777, Cl. 55-16.000.
Granquist, Victor M.: *See*—
House, Roy F.; and Granquist, Victor M., 4,597,878, Cl. 252-8.50M.
Grant, George A. Safe sensory irritant. 4,598,096, Cl. 514-715.000.
Graphic Controls Canada Ltd.: *See*—
Meathrel, William G., 4,597,942, Cl. 422-57.000.
Grau, Werner: *See*—
Roller, Hermann; Hack, Joachim; Woweries, Uwe; Lehner, August; Grau, Werner; Nagel, Peter; and Falk, Roland, 4,597,990, Cl. 427-130.000.
Gravier, Denis: *See*—
Gravier, Maurice; Gravier, Denis; and Gravier, Jean-Claude, 4,597,376, Cl. 126-121.000.
Gravier, Jean-Claude: *See*—
Gravier, Maurice; Gravier, Denis; and Gravier, Jean-Claude, 4,597,376, Cl. 126-121.000.
Gravier, Maurice; Gravier, Denis; and Gravier, Jean-Claude. Heat recovery hood. 4,597,376, Cl. 126-121.000.
Graviner Limited: *See*—
Moore, Peter E.; and Davies, David H. J., 4,597,451, Cl. 169-61.000.
Gray, H. William: *See*—
Redding, Thomas P.; and Gray, H. William, 4,597,571, Cl. 271-150.000.
Green, Alex E. S.; and Green, Bruce A. S., to University of Florida. Method and apparatus of gas-coal combustion in steam boilers. 4,597,342, Cl. 110-347.000.
Green, Bruce A. S.: *See*—
Green, Alex E. S.; and Green, Bruce A. S., 4,597,342, Cl. 110-347.000.
Green, Peter J.: *See*—
Byford, Derek C.; Green, Peter J.; and Lewis, Alun, 4,597,893, Cl. 252-354.000.
Greenwald, Steve. Ice and snow melt. 4,597,884, Cl. 252-70.000.
Grellmann, H. Erwin; Jones, Keith E.; and Wright, John A., to Tektronix, Inc. Capacitive tuning screw. 4,598,334, Cl. 361-290.000.
Griffin, James L., to Illinois Tool Works Inc. Electrical control telemetering device. 4,598,291, Cl. 340-870.370.
Griffith, Eugene R., Jr.; and Connett, Steven T. Sound system employing automatic proportional amplification. 4,598,418, Cl. 381-83.000.
Gritter, David J.: *See*—
Gale, Allan R.; and Gritter, David J., 4,598,240, Cl. 318-429.000.
Groenke, Jeffery W.; and Halliday, Wallace S., to Hewlett-Packard Company. Plotter having automatic sheet feeder. 4,598,298, Cl. 346-1.100.
Grollier, Jean F.; Dubief, Claude; and Cauwet, Daniele, to L'Oreal. Hair-care composition and hair treatment process. 4,597,962, Cl. 424-47.000.
Gronvald, Frederik C.: *See*—
Lundt, Behrend F.; Jorgensen, Karin D.; Johansen, Nils L.; Gronvald, Frederik C.; Frandsen, Erik K.; Moody, Alister J.; and Markussen, Jan, 4,598,065, Cl. 514-12.000.
Groupe Industriel de Realisations et Applications: *See*—
Couillard, Francois, 4,597,866, Cl. 210-198.200.
Groves, William A.; Snook, Matthew L.; and Browen, Rodney, to Hewlett-Packard Company. Circuit tester having indirect counters. 4,598,245, Cl. 324-73.00R.
Grudinka, Ekaterina I.: *See*—
Terentiev, Otto A.; Burov, Anatoly V.; Vorobieva, Ekaterina Y.; Grudinka, Ekaterina I.; Nesterchuk, Gennady T.; Shapovalov, Oleg I.; Usmanov, Khamdam U.; Mirkamilov, Shavkat M.; Mirkamilov, Tolkun M.; and Sharkov, Vladimir V., 4,597,928, Cl. 264-87.000.
Gruenwald, James D., to Clearwater Technologies, Inc. Rehabilitated manhole cover. 4,597,692, Cl. 404-25.000.
Grumman Aerospace Corporation: *See*—
Devino, Vincent A., 4,598,292, Cl. 340-973.000.
Grumman Corporation: *See*—
Brandstetter, Robert W.; Lynn, Otto F.; Reich, Abraham; and Waido, Richard P., 4,597,630, Cl. 350-3.830.
Grychtol, Klaus: *See*—
Eisert, Manfred; and Grychtol, Klaus, 4,597,912, Cl. 558-403.000.
GTE Automatic Electric Inc.: *See*—
Perry, Thomas J., 4,598,268, Cl. 340-347.0DD.
Perry, Thomas J.; and Khera, Muhammad I., 4,598,404, Cl. 371-49.000.
Reimer, William A., 4,597,618, Cl. 339-65.000.
GTE Communication Products Corporation: *See*—
Reed, Edward D., Jr.; and Benedict, George J., 4,598,405, Cl. 372-12.000.
GTE Communication Systems Corporation: *See*—
Neese, Wayne E., 4,598,166, Cl. 174-68.500.
Pommer, Karl E., II, 4,598,174, Cl. 179-84.0VF.
Reimer, William A., 4,597,619, Cl. 339-75.0MP.
Selby, Steve F., 4,598,181, Cl. 200-5.00A.
GTE Communications Systems Corporation: *See*—
Bernardson, Peter S., 4,598,266, Cl. 340-347.0DD.
GTE Laboratories Incorporated: *See*—
Buhrer, Carl F., 4,597,640, Cl. 350-405.000.
Sandman, Daniel J., 4,597,914, Cl. 260-550.000.
GTE Products Corporation: *See*—
Barnhart, Robert V., 4,597,816, Cl. 156-263.000.
Bouchard, Andre C., 4,598,230, Cl. 313-493.000.
English, George J.; Gagnon, Peter R.; and Leadvaro, Stephen J., 4,598,342, Cl. 362-213.000.
Gagnon, Peter R., 4,598,225, Cl. 313-17.000.
Mizuhara, Howard, 4,598,025, Cl. 428-450.000.
Gueret, Jean-Louis H., to L'Oreal. Bottle and closure having angular positioning means. 4,597,501, Cl. 215-330.000.

Guerret, Patrick G.: *See*—
Strolin-Benedetti, Margherita; Guerret, Patrick G.; Langlois, Michel; and Dostert, Philippe L., 4,598,084, Cl. 514-374.000.

Guest, William H. Snow plow clamp assembly. 4,597,205, Cl. 37-241.000.

Guhse, Raymond A., to United States of America, Navy. Test signal generator for coherent air-to-ground radars. 4,598,294, Cl. 343-17.700.

Guiver, Michael D.; Kutowy, Oleh; and Apsimon, John W., to Canadian Patents and Development Limited. Polyarylene polyethersulfone ionomers. 4,598,137, Cl. 528-173.000.

Gum, Peter H.; Levin, Arthur L.; Smith, Ronald M.; and Wilson, John H., to International Business Machines Corporation. Efficient trace method adaptable to multiprocessors. 4,598,364, Cl. 364-300.000.

Gurnee, Mark N.: *See*—
Dries, Michael F.; and Gurnee, Mark N., 4,598,414, Cl. 377-58.000.

Gurtner, Bernard: *See*—
Cohen, Joseph; Gurtner, Bernard; and Bertaud, Yves, 4,597,840, Cl. 204-67.000.

H.R. Electronics Company: *See*—
Giacomo, Harlan R., 4,598,378, Cl. 364-479.000.

Haacon Hebetechnik GmbH: *See*—
Wenzel, Jorg, 4,597,561, Cl. 254-45.000.

Haage, Hans-Jurgen: *See*—
Disteldorf, Josef; Haage, Hans-Jurgen; and Schnurbusch, Horst, 4,598,121, Cl. 524-874.000.

Hack, Joachim: *See*—
Roller, Hermann; Hack, Joachim; Woweries, Uwe; Lehner, August; Grau, Werner; Nagel, Peter; and Falk, Roland, 4,597,990, Cl. 427-130.000.

Hadvary, Paul; Hochuli, Erich; Kupfer, Ernst; Lengsfeld, Hans; and Weibel, Ernst K., to Hoffmann-La Roche Inc. Leucine derivatives. 4,598,089, Cl. 514-449.000.

Hafner, Udo; and Knapp, Heinrich, to Robert Bosch GmbH. Electromagnetically actuatable valve. 4,597,558, Cl. 251-129.150.

Hagele, Hermann: *See*—
Dolata, Hans; Meyle, Werner; Linke, Wilfried; Hagele, Hermann; and Buck, Ernst, 4,597,178, Cl. 30-138.000.

Hagemeister, Klaus; and Hueber, Alfred. Tubular distributor arrangement for a heat collector vessel. 4,597,436, Cl. 165-76.000.

Hagen Batterie AG: *See*—
Kiessling, Rainer; Plzak, Voitech; and Wendt, H., 4,597,841, Cl. 204-115.000.

Hager, Bror O. Preservative treatment of wood. 4,597,940, Cl. 422-32.000.

Hagiwara Denki Kabushiki Kaisha: *See*—
Hiramatsu, Tadao; and Katayama, Sunao, 4,598,375, Cl. 364-569.000.

Hagiwara, Yoshiyuki; and Morishita, Teru, to Taiho Kogyo Co.; and Toyota Motor Corp. Leaf-type foil thrust bearing. 4,597,677, Cl. 384-105.000.

Hahn, Hans: *See*—
Muller, Gerhard; Hahn, Hans; and Tropschuh, Walter, 4,597,752, Cl. 493-410.000.

Haitko, Deborah A., to General Electric Company. Copper (I)-phenoxides useful in polyphenylene oxide preparation. 4,598,140, Cl. 528-215.000.

Hajdu, Istvan: *See*—
Toth, Edit; Torley, Jozsef; Palosi, Eva; Szebereneyi, Szabolcs; Szporny, Laszlo ; Gorog, Sandor; and Hajdu, Istvan, 4,598,080, Cl. 514-277.000.

Hakansson, Sven, to Axel Johnson Engineering AB. Plate pack for an inclined plate separator. 4,597,869, Cl. 210-232.000.

Hake, Timothy S.: *See*—
Goudriaan, Frans; Hake, Timothy S.; Ladeur, Peter; Moureaux, Patrique; Saint, Jean-Paul; and van Dijk, Nicolaas, 4,598,059, Cl. 502-228.000.

Halberstadt, Alex L.; and Letchford, John A., to Thorn EMI plc. Quartz infra-red lamps. 4,598,194, Cl. 219-464.000.

Hall, Mark N., to Hallsonic Corporation. Regasifying pasteurization system. 4,597,876, Cl. 210-748.000.

Halliday, Wallace S.: *See*—
Groenke, Jeffery W.; and Halliday, Wallace S., 4,598,298, Cl. 346-1.100.

Hallsonic Corporation: *See*—
Hall, Mark N., 4,597,876, Cl. 210-748.000.

Hamada, Masami; Tanaka, Kiyokazu; Kikuchi, Takeshi; Asai, Yasuhiro; Hayashi, Chihiro; and Ohtake, Fumio, to Sumitomo Metal Industries, Ltd. Method for producing I-beam having centrally corrugated web. 4,597,278, Cl. 72-187.000.

Hamana, Ryozo: *See*—
Ayusawa, Tadashi; Mori, Shoichiro; Aoki, Tadamichi; and Hamana, Ryozo, 4,598,159, Cl. 549-492.000.

Hamanaka, Toshiyuki: *See*—
Mochida, Shigeru; Yamada, Shunichi; and Hamanaka, Toshiyuki, 4,598,054, Cl. 501-112.000.

Hamasaki, Yoshiharu: *See*—
Takagi, Kiyoshi; Toda, Ichiro; Hamasaki, Yoshiharu; and Wakamiya, Yoshinori, 4,598,377, Cl. 364-472.000.

Hamill, James; Digumarthi, Ramarao; Conlon, William; Cheng, Dau Y.; and Chang, Chun-Nan, to International Power Technology, Inc. Method and apparatus for improved shutdown procedures in dual fluid Cheng cycle engines. 4,597,256, Cl. 60-39.050.

Hamilton, Bonnie, to Solar-Kist Corporation. Handicraft bonding. 4,597,812, Cl. 156-63.000.

Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Method of making feed wheel. 4,597,152, Cl. 29-433.000.

Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Label printing and applying apparatus. 4,597,331, Cl. 101-110.000.

Hana Biologics, Inc.: *See*—
Masover, Gerald K.; and Drysdale, Milton G., 4,598,045, Cl. 435-34.000.

Handler, Milton E.; Sylvan, Richard; and Baisch, Herbert, to Hirsh Company. Free-standing drawer. 4,597,122, Cl. 5-503.000.

Hane, Toshioki: *See*—
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,597,913, Cl. 558-436.000.

Hanewald, Richard H.; and Pargeter, John K., to International Metals Reclamation Company, Inc., The. Rotary hearth. 4,597,564, Cl. 266-274.000.

Haney, Paul S.: *See*—
Gennaro, Gerald P.; and Haney, Paul S., 4,597,951, Cl. 423-2.000.

Hanscom, Bradford E.; and Mock, Gerald L., to Fortel Corporation. Voice operated telephone answering system. 4,598,171, Cl. 179-6.140.

Hansen, Elo H.: *See*—
Ruzicka, Jaromir; and Hansen, Elo H., 4,597,298, Cl. 73-863.710.

Hansen, Frederick C.; and Kiehlbauch, Richard A., to S. C. Johnson & Son, Inc. Coatings containing an alphaolefin terpolymer. 4,598,118, Cl. 524-517.000.

Hansen, Hans L.: *See*—
Petersen, Hans C.; Thomsen, Svend E.; and Hansen, Hans L., 4,597,725, Cl. 418-61.00B.

Hanser, Paul E., to HWH Corporation. Automatic levelling system. 4,597,584, Cl. 280-6.00R.

Hanson, Merlin L.: *See*—
Swenson, Robert E.; Hanson, Merlin L.; and Kelson, Larry J., 4,598,357, Cl. 364-200.000.

Hanson, Raymond, to USM Corporation. Apparatus for heating shoe parts. 4,598,193, Cl. 219-215.000.

Hanula, Richard M. Biased pin retainer block for a rotary coupling system. 4,597,499, Cl. 213-50.500.

Haque, Reza; Smith, Edward F., III; and Kadija, Igor V., to Olin Corporation. One-step plasma treatment of copper foils to increase their laminate adhesion. 4,598,022, Cl. 428-413.000.

Hara, Seiji: *See*—
Awane, Misao; Hara, Seiji; and Kobayashi, Satoshi, 4,598,379, Cl. 364-479.000.

Hara, Yoshio; and Ishino, Yoshiaki, to Fuji Photo Film Co., Ltd. Self-processing photographic film unit with dissolvable trap member. 4,598,041, Cl. 430-498.000.

Harbour, John; and Barnett, John D., to TRW Probe Electronics Co. Ltd. Strain transducers. 4,597,154, Cl. 29-525.000.

Harnisch, Horst: *See*—
Kuhlthau, Hans-Peter; and Harnisch, Horst, 4,598,151, Cl. 546-167.000.

Harold Simpson, Inc.: *See*—
Simpson, Harold G., 4,597,234, Cl. 52-478.000.

Harris, Harold S., to United Technologies Corporation. Combustor mount. 4,597,258, Cl. 60-39.310.

Hartenstein, Johannes: *See*—
Barth, Hubert; Fritschi, Edgar; Ganser, Volker; Hartenstein, Johannes; Herrmann, Manfred; and Satzinger, Gerhard, 4,598,076, Cl. 514-230.000.

Hartleb, Jochem: *See*—
Krieger, Karl; Hartleb, Jochem; and Reinelt, Werner, 4,597,557, Cl. 251-63.400.

Hartman, Kathy J.: *See*—
Shu, Winston R.; and Hartman, Kathy J., 4,597,443, Cl. 166-272.000.

Haruta, Masahiro: *See*—
Ohta, Tokuya; Yano, Yasuhiro; Matsufuji, Yohji; Haruta, Masahiro; and Eida, Tsuyoshi, 4,597,794, Cl. 106-20.000.

Harvey, Dennis N., to MTS Systems Corporation. Optical grid analyzer system for automatically determining strain in deformed sheet metal. 4,598,420, Cl. 382-8.000.

Harvey, Donald M.; and Seely, Neil G., to Eastman Kodak Company. Coded roll film holder and code responsive camera. 4,597,654, Cl. 354-21.000.

Harvey, Donald M.: *See*—
Seely, Neil G.; and Harvey, Donald M., 4,597,653, Cl. 354-21.000.

Hashimoto, Akira: *See*—
Nishimura, Toshihiro; Nakayama, Muneo; and Hashimoto, Akira, 4,597,882, Cl. 252-51.000.

Hass, Robert H., to Union Oil Company of California. Process for removing sox and nox compounds from gas streams. 4,597,954, Cl. 423-138.000.

Hatsuse, Toshikazu: *See*—
Koyama, Isao; and Hatsuse, Toshikazu, 4,597,228, Cl. 51-235.000.

Hauffe, Dieter, to Parker Chemical Company. Process for maintaining the zinc content in zinc phosphate baths. 4,597,806, Cl. 148-6.15Z.

Havemann, Robert H., to Texas Instruments Incorporated. Trench isolation process for integrated circuit devices. 4,597,164, Cl. 29-576.00W.

Hawkins, Joel W. Mounting apparatus for satellite dish antennas. 4,598,297, Cl. 343-882.000.

Hayakawa, Yoichi: *See*—
Otake, Noboru; Kawai, Hiroyuki; Hayakawa, Yoichi; Nakagawa, Masaya; Imamura, Kanji; and Tanabe, Kozo, 4,598,146, Cl. 536-6.400.

Hayakawa, Yoshinori: *See*—
Fujii, Tadashi; and Hayakawa, Yoshinori, 4,597,292, Cl. 73-599.000.

Hayashi, Akio: *See—*
Kotani, Kunio; Hayashi, Akio; and Taniguchi, Seiho, 4,598,127, Cl. 525-229.000.
Hayashi, Chihiro: *See—*
Hamada, Masami; Tanaka, Kiyokazu; Kikuchi, Takeshi; Asai, Yasuhiro; Hayashi, Chihiro; and Ohtake, Fumio, 4,597,278, Cl. 72-187.000.
Hayashi, Eikichi, to Mitsubishi Denki Kabushiki Kaisha. Orthogonal type gas laser oscillator. 4,598,407, Cl. 372-87.000.
Hayashi, Masao: *See—*
Hiraki, Akio; Miyasato, Tatsuro; and Hayashi, Masao, 4,597,844, Cl. 204-192.00C.
Hayashi, Teruaki: *See—*
Hikino, Hiroshi; and Hayashi, Teruaki, 4,598,069, Cl. 514-54.000.
Hayashi, Yoshimasa, to Nissan Motor Co., Ltd. Engine valve and method of producing the same. 4,597,367, Cl. 123-188.0AA.
Hayashi, Yutaka; and Izawa, Hisao, to Nippon Kogaku K.K. Mask feed method and apparatus for exposure replicate systems. 4,598,242, Cl. 318-640.000.
Hayashima, Toshitaka: *See—*
Suzaki, Masayuki; Nishiwaki, Shoji; Hayashima, Toshitaka; Araki, Shigeyuki; and Momose, Masanori, 4,598,301, Cl. 346-76.0PH.
Hays, William L.: *See—*
Roesner, Bruce B.; and Hays, William L., 4,598,386, Cl. 365-105.000.
Haythornthwaite, James. Sports racquet utilizing non-circular strings. 4,597,576, Cl. 273-73.00D.
Hazenbroek, Jacobus E. On-line wing removal system. 4,597,136, Cl. 17-52.000.
Heat Transfer Technology Limited: *See—*
Tozer, Michael J. C., 4,597,596, Cl. 285-187.000.
Heath, Rodney T.: *See—*
Dean, Alvin; and Heath, Rodney T., 4,597,733, Cl. 431-285.000.
Heath, Timothy D.: *See—*
Papahadjopoulos, Demetrios P.; and Heath, Timothy D., 4,598,051, Cl. 436-512.000.
Heeres, Jan; Backx, Leo J. J.; and Mostmans, Joseph A., to Janssen Pharmaceutica N.V. Fungicidal 1-(2-aryl-2-R-ethyl)-1H-1,2,4-triazoles. 4,598,085, Cl. 514-383.000.
Hehl, Karl. Insertion code arrangement for interchangeable circuit board modules. 4,598,336, Cl. 361-391.000.
Heiden, Donald J. Snow pusher with adjustable handle. 4,597,204, Cl. 37-285.000.
Heinecke, Steven B., to Minnesota Mining and Manufacturing Company. Thin film surgical dressing with delivery system. 4,598,004, Cl. 428-40.000.
Heinemann, Otto; Baldus, Heinz-Dieter; Supp, Armin; Nanz, Hans; Thieme, Helmut; and Rasch, Heinz, to Krupp Polysius AG. Air-controlled settling apparatus. 4,597,867, Cl. 210-218.000.
Heitkamper, Peter: *See—*
Konig, Klaus; and Heitkamper, Peter, 4,597,910, Cl. 560-359.000.
Heitz, Walter; and Strohriegl, Peter, to Bayer Aktiengesellschaft. Process for the preparation of aromatic polyamide in the presence of $SiCl_4$. 4,598,143, Cl. 528-336.000.
Helderle, Paul M., to Compagnie Francaise des Petroles. Safety valves for wells. 4,597,446, Cl. 166-322.000.
Hellyer, James A.: *See—*
Forand, Joseph T.; and Hellyer, James A., 4,597,770, Cl. 44-51.000.
Helmsing, Gerhard: *See—*
Kochy, Fritz; Brandel, Klaus; Hullmann, Horst; Neumann, Bernhard; and Helmsing, Gerhard, 4,597,461, Cl. 180-90.000.
Helmut Lingemann GmbH & Co.: *See—*
Lingemann, Horst, 4,597,232, Cl. 52-304.000.
Hendrickson, Melvin C., to Zenith Electronics Corporation. Television signal scrambling system. 4,598,313, Cl. 358-124.000.
Hendriks, Albertus G.; and Mijnders, Aart, to Lever Brothers Company. Process and apparatus for the aseptic packaging of products such as foodstuffs and pharmaceutical products. 4,597,242, Cl. 53-426.000.
Henkener, Jerry A.: *See—*
Collins, Jerry C.; Warner, Charles P.; Henkener, Jerry A.; and Glauser, Rolf, 4,598,290, Cl. 340-850.000.
Hennequin, Jean-Claude: *See—*
Capo-Gual, Christine; Delattre, Luc; and Hennequin, Jean-Claude, 4,597,651, Cl. 351-243.000.
Henning, Haden V.; Warthan, Jerry G.; and Fajt, John, to Lightmasters, Ltd. Luminous tube color generator. 4,598,229, Cl. 313-493.000.
Hennings, Detlev F. K.; Janssen, Rolf P.; and Reijnen, Piet, to U.S. Philips Corporation. Method of manufacturing ceramic sintered bodies. 4,598,055, Cl. 501-137.000.
Henningsen, Charles G.: *See—*
Lax, Ronald G.; Johnson, Robert G.; Henningsen, Charles G.; and Ellis, J. Scott, 4,597,624, Cl. 339-143.00R.
Henry, Ralph E., to Dresser Industries, Inc. Stop changer tool for in-service valve. 4,597,147, Cl. 29-213.00R.
Hentschel, Christian; and Schmid, Wolfgang, to Hewlett-Packard Company. Safety device for controlling a light signal generator based on fiber position. 4,598,199, Cl. 250-222.100.
Hepworth, Mark N., to Rockwell International Corporation. Background raster generator. 4,598,236, Cl. 315-403.000.
Herchen, Stephen R.; and Widiger, Gary N., to Polaroid Corporation, Patent Dept. Novel image dye-providing materials and photographic products and processes. 4,598,158, Cl. 549-394.000.
Hercules Incorporated: *See—*
Leach, Douglas R., 4,598,102, Cl. 521-93.000.
Sand, Michael L., 4,598,006, Cl. 424-81.000.
Herman, David E.: *See—*
Burgess, Lester E.; McGarry, Phillip E.; and Herman, David E., 4,597,858, Cl. 209-166.000.
Hermann Hemscheidt Maschinenfabrik GmbH & Co.: *See—*
Krieger, Karl; Hartleb, Jochem; and Reinelt, Werner, 4,597,557, Cl. 251-63.400.
Herrmann, Manfred: *See—*
Barth, Hubert; Fritschi, Edgar; Ganser, Volker; Hartenstein, Johannes; Herrmann, Manfred; and Satzinger, Gerhard, 4,598,076, Cl. 514-230.000.
Herron, Lester W.; and Nufer, Robert W., to International Business Machines Corporation. Stepwise/ultimate density milling. 4,598,107, Cl. 523-351.000.
Hethuin, Serge: *See—*
Marin, Guy F. M.; and Hethuin, Serge, 4,598,289, Cl. 340-870.340.
Hettiger, James, to RCA Corporation. Tuning circuit for a multiband tuner. 4,598,423, Cl. 455-191.000.
Hewlett-Packard Company: *See—*
Groenke, Jeffery W.; and Halliday, Wallace S., 4,598,298, Cl. 346-1.100.
Groves, William A.; Snook, Matthew L.; and Browen, Rodney, 4,598,245, Cl. 324-73.00R.
Hentschel, Christian; and Schmid, Wolfgang, 4,598,199, Cl. 250-222.100.
Heyden, Gunter, to Winkler & Dunnebier Maschinenfabrik und Eisengiesserei GmbH & Co. KG. Quick change cutting cylinder arrangement. 4,597,317, Cl. 83-346.000.
HEYL Chemisch-pharmazeutische Fabrik GmbH & Co KG: *See—*
Walter, Peter; and Walter, Michael, 4,597,762, Cl. 623-1.000.
Heyne, Carl J.; Tomasic, Nicholas A.; and Wu, Jiing-Liang, to Westinghouse Electric Corp. Magnetically operated circuit breaker. 4,598,263, Cl. 335-14.000.
Hicks, Bradford W.; Rolf, Jeffrey O.; and Valentine, Lewis J., to Eaton Corporation. Convertible axle. 4,597,312, Cl. 74-695.000.
Hikino, Hiroshi; and Hayashi, Teruaki, to Toyo Yakushoku Kogyo Co. Ltd. Method of treating hypoglycemia using aloes polysaccharides. 4,598,069, Cl. 514-54.000.
Hilal, Said S.; and Nashef, Aws, to American Hospital Supply Corporation. Implantable bioprosthetic tendons and ligaments. 4,597,766, Cl. 623-13.000.
Hilbert, Samuel D.; and McConnell, Richard L., to Eastman Kodak Company. Copolyester adhesives. 4,598,142, Cl. 528-295.000.
Hill, Jeffrey A.; Yohn, Robert L.; Modi, Ashok L.; and Newton, Kevin H., to Diebold, Incorporated. Depository envelope printing mechanism. 4,597,330, Cl. 101-93.010.
Hillis, W. Daniel, to Thinking Machines Corporation. Method and apparatus for routing message packets. 4,598,400, Cl. 370-60.000.
Hinchey, Richard J.; and Caglione, Alexander J., to Union Carbide Corporation. Treatment process for removing fluoride impurities from aluminosilicates. 4,597,956, Cl. 423-328.000.
Hinkel, Holger: *See—*
Bayer, Thomas; Hinkel, Holger; Kleischmann, Kurt; Kuenzel, Ulrich; and Schafer, Rolf, 4,598,017, Cl. 428-336.000.
Hipkins, Jim L. Method of making a reinforced preformed building wall. 4,597,813, Cl. 156-79.000.
Hirai, Kazuo; and Matsushita, Takao, to Toray Silicone Company, Ltd. Silicone primer composition. 4,598,134, Cl. 528-17.000.
Hiraki, Akio; Miyasato, Tatsuro; and Hayashi, Masao, to Kabushiki Kaisha Meidensha. Coating film and method and apparatus for producing the same. 4,597,844, Cl. 204-192.00C.
Hiramatsu, Tadao; and Katayama, Sunao, to Hagiwara Denki Kabushiki Kaisha. Time measuring circuit. 4,598,375, Cl. 364-569.000.
Hirano, Hiroyuki: *See—*
Tanaka, Yoshikazu; Yamamuro, Sigeaki; Abo, Keiju; Kumura, Haruyoshi; Hirano, Hiroyuki; and Morimoto, Yoshiro, 4,597,308, Cl. 74-866.000.
Hirasaki, George J.: *See—*
Dilgren, Richard E.; Lau, Hon C.; and Hirasaki, George J., 4,597,442, Cl. 166-272.000.
Hirashiba, Yuji; Kawai, Shinji; and Oguma, Tomio, to Aisin Seiki Kabushiki Kaisha. Sanitary device. 4,597,111, Cl. 4-420.400.
Hirata, Sumiaki; Ito, Masazumi; and Shibazaki, Kenji, to Minolta Camera Kabushiki Kaisha. Copier start button with diagnostic information. 4,597,662, Cl. 355-14.00R.
Hirokawa, Haruo; and Miyahira, Hitoshi, to Hirose Electric Co., Ltd. Pressure connection device for a connector. 4,597,158, Cl. 29-566.300.
Hironaga, Saburo. Garment. 4,597,109, Cl. 2-304.000.
Hirose Electric Co., Ltd.: *See—*
Hirokawa, Haruo; and Miyahira, Hitoshi, 4,597,158, Cl. 29-566.300.
Hirsch, Hermann. Connecting member for straps, bands or the like. 4,597,138, Cl. 24-265.00B.
Hirsh Company: *See—*
Handler, Milton E.; Sylvan, Richard; and Baisch, Herbert, 4,597,122, Cl. 5-503.000.
Hitachi Chemical Company, Ltd.: *See—*
Fujioka, Atsushi; Miyadera, Yasuo; and Fukuda, Tomio, 4,598,115, Cl. 524-376.000.
Hitachi Elevator Engineering & Service Co., Ltd.: *See—*
Kawashima, Mikio, 4,597,992, Cl. 427-140.000.
Hitachi, Ltd.: *See—*
Kanda, Hiroshi; Ishikawa, Isao; Katakura, Kageyoshi; and Nakaya, Chitose, 4,597,293, Cl. 73-606.000.
Kitayama, Yukio; Ochiai, Izumi; Nozawa, Yoshio; Miyagi, Masahiro; Ayabe, Tadaaki; and Uehara, Katsuharu, 4,597,171, Cl. 29-727.000.

Morita, Koyo; Nomura, Keizo; Nishizuka, Hiroshi; Hoshi, Tai; Tamiya, Yoichiro; and Asakawa, Terushige, 4,598,197, Cl. 250-205.000.
Okouchi, Isao; Izumi, Kenkichi; Takahashi, Sankichi; Mukai, Yasuteru; and Tomida, Akira, 4,597,871, Cl. 210-456.000.
Takahasi, Toru; and Ueno, Sadayasu, 4,597,850, Cl. 204-426.000.
Terasawa, Tsuneo; Kuniyoshi, Shinji; Takanashi, Akihiro; Kurosaki, Toshiei; Kawamura, Yoshio; and Hosaka, Sumio, 4,597,669, Cl. 356-401.000.
Umetani, Keiji; Suzuki, Atsushi; Nakagawa, Manabu; Yoshida, Minoru; Kawaguchi, Fumio; Yamada, Hiromichi; and Koike, Kouichi, 4,598,203, Cl. 250-366.000.
Ushifusa, Nobuyuki; Ogihara, Satoru; and Noro, Takanobu, 4,598,167, Cl. 174-68.500.

Hitachi Medical Corporation: *See*—
Umetani, Keiji; Suzuki, Atsushi; Nakagawa, Manabu; Yoshida, Minoru; Kawaguchi, Fumio; Yamada, Hiromichi; and Koike, Kouichi, 4,598,203, Cl. 250-366.000.

Hitachi Metals Ltd.: *See*—
Yamashita, Keitaro, 4,597,661, Cl. 355-3.0DD.

Hitachi Ome Electronic Co., Ltd.: *See*—
Morita, Koyo; Nomura, Keizo; Nishizuka, Hiroshi; Hoshi, Tai; Tamiya, Yoichiro; and Asakawa, Terushige, 4,598,197, Cl. 250-205.000.

Hjelm, Bo A. Scaffolding system. 4,597,472, Cl. 182-178.000.

Hobo, Sumiya; Shimizu, Toshio; and Nishida, Masaru, to Kyocera Corporation. Melting and pressure casting device. 4,597,431, Cl. 164-253.000.

Hochuli, Erich: *See*—
Hadvary, Paul; Hochuli, Erich; Kupfer, Ernst; Lengsfeld, Hans; and Weibel, Ernst K., 4,598,089, Cl. 514-449.000.

Hockemeyer, Friedrich; and Preiner, Gerhard, to Wacker-Chemie GmbH. Organopolysiloxanes containing both acryloxyalkyl groups and Si-bonded hydrogen atoms in the same molecule. 4,597,987, Cl. 427-54.100.

Hodges, Anthony N. Adjustable keyboard. 4,597,681, Cl. 400-488.000.

Hodogaya Chemical Co., Ltd.: *See*—
Sensui, Hideyuki; Suzuka, Susumu; Gonda, Michihiro; and Kikkawa, Katsumasa, 4,597,795, Cl. 106-21.000.

Hoechst Aktiengesellschaft: *See*—
Ernst, Josef; and Semmler, Hans-Joachim, 4,597,796, Cl. 106-74.000.
Lal, Bansi; Dornauer, Horst; Bhattacharya, Bani K.; Dohadwalla, Alihussein N.; and de Souza, Noel J., 4,598,148, Cl. 544-252.000.
Uhrig, Heinz; Ehl, Klaus; and Deubel, Reinhold, 4,597,906, Cl. 260-401.000.

Hoechst-Roussel Pharmacueticals Inc.: *See*—
Davis, Larry; and Klein, Joseph T., 4,598,152, Cl. 546-198.000.

Hoefs, Cornelis A. M., to Akzo NV. Water reducible composition based on an epoxy resin. 4,598,108, Cl. 523-411.000.

Hoffman, Arnold: *See*—
Netz, Yoel; and Hoffman, Arnold, 4,598,040, Cl. 430-405.000.

Hoffman, Leonard M.; and Kimball, John B., to United States of America, Navy. Chaff dispenser for atmospheric re-entry. 4,597,332, Cl. 102-505.000.

Hoffmann-La Roche Inc.: *See*—
Hadvary, Paul; Hochuli, Erich; Kupfer, Ernst; Lengsfeld, Hans; and Weibel, Ernst K., 4,598,089, Cl. 514-449.000.
Truesdale, Larry K., 4,598,160, Cl. 560-144.000.

Hogenhout, Franciscus, to West Coast Industries, Inc. Method and apparatus for coldworking holes. 4,597,282, Cl. 72-370.000.

Hoglund, Hans E.: *See*—
Andersson, Per-Erik; Annergren, Goran E.; Hoglund, Hans E.; and Peterson, Per V., 4,597,872, Cl. 210-605.000.

Holekamp, Malcolm L. Angled boom dredge system and cutterhead therefor. 4,597,201, Cl. 37-64.000.

Holles Laboratories, Inc.: *See*—
Holly, Frank J., 4,597,965, Cl. 424-81.000.

Hollis, James T.: *See*—
Bergloff, Raymond A.; and Hollis, James T., 4,597,548, Cl. 244-104.0FP.

Holly, Frank J., to Holles Laboratories, Inc. Method and composition for controlling corneal hydration. 4,597,965, Cl. 424-81.000.

Holly, Harry H.; and Holly, James A., to Holly Systems, Inc. Food patty forming method and apparatus employing two or more agitator bars. 4,597,135, Cl. 17-45.000.

Holly, James A.: *See*—
Holly, Harry H.; and Holly, James A., 4,597,135, Cl. 17-45.000.

Holly Systems, Inc.: *See*—
Holly, Harry H.; and Holly, James A., 4,597,135, Cl. 17-45.000.

Holmes, Alan, to Romag Holdings Ltd. Security and protection panel. 4,598,274, Cl. 340-550.000.

Holmes, John G.; Messina, Elena R.; Resnick, Brian J.; and Teach, Charles C., to Cincinnati Milacron Inc. Method and apparatus for controlling manipulator and workpiece positioner. 4,598,380, Cl. 364-513.000.

Holt, Dewey L.; and Reynolds, Benjamin F., to R. J. Reynolds Tobacco Company. Farmer's bale delaminator. 4,597,396, Cl. 131-327.000.

Honda Giken Kogyo K.K.: *See*—
Sakurai, Yoshimi; Aoki, Takashi; and Nishikawa, Masao, 4,597,482, Cl. 192-0.052.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Nagase, Hidenobu; and Makino, Yuji, 4,597,915, Cl. 261-29.000.
Nakajima, Tetsuo; and Aoi, Tomio, 4,598,370, Cl. 364-426.000.
Sano, Shoichi; and Furukawa, Yoshimi, 4,597,462, Cl. 180-140.000.
Takagi, Kazunori; Soma, Hiroshi; Miyata, Yoshiaki; Motozawa, Yasuki; and Katou, Hitoshi, 4,597,470, Cl. 181-141.000.
Watanabe, Masaki; Yagasaki, Akio; Murayama, Toru; and Yonekura, Kazuya, 4,597,931, Cl. 264-129.000.
Yamada, Kozo, 4,597,466, Cl. 180-225.000.
Yasuoka, Akimasa; and Otobe, Yutaka, 4,597,370, Cl. 123-493.000.

Honda, Yukio: *See*—
Kawaguchi, Hiroshi; Nishina, Shuho; Nakanishi, Nobuyasu; and Honda, Yukio, 4,597,307, Cl. 74-512.000.

Honegger, Werner, to Ferag AG. Method and apparatus for the storage of products, especially printed products, arriving continuously, especially in an imbricated formation. 4,597,243, Cl. 53-430.000.

Honeywell: *See*—
Spiesman, Robert L., 4,598,212, Cl. 307-3.000.
Stickel, Robert, 4,597,741, Cl. 434-27.000.

Honeywell GmbH: *See*—
Stickel, Robert, 4,597,740, Cl. 434-20.000.

Honeywell Inc.: *See*—
Adams, John T.; and Bohan, John E., Jr., 4,598,333, Cl. 361-286.000.
Atherton, Larry S., 4,598,322, Cl. 358-213.000.
Doddapaneni, Narayan; and Chua, David L., 4,598,029, Cl. 429-50.000.
Dries, Michael F.; and Gurnee, Mark N., 4,598,414, Cl. 377-58.000.
Jenekhe, Samson A.; and Fure, Barbara J., 4,598,139, Cl. 528-248.000.
Leiner, Hans R., 4,598,326, Cl. 360-40.000.
Szonntagh, Eugene L., 4,597,778, Cl. 55-18.000.

Honeywell Information Systems Inc.: *See*—
Boothroyd, Donald C.; and Norman, Robert W., Jr., 4,598,359, Cl. 364-200.000.
Boothroyd, Donald C.; Norman, Robert W., Jr.; and Keller, Howard J., 4,598,365, Cl. 364-200.000.

Hong, Min-Tai, to Fulet Electronic Industrial Company. Power amplifier apparatus. 4,598,255, Cl. 330-297.000.

Hong, Steve. Safety shoe. 4,597,199, Cl. 36-114.000.

Honjo, Takeshi; Kitahara, Makoto; Suzuki, Yasumichi; and Takahata, Naomi, to Canon Kabushiki Kaisha. Image processing apparatus. 4,598,323, Cl. 358-285.000.

Honjo, Toshio; and Seki, Yukio, to Nippon Iron Powder Co., Ltd. Ferrite carriers for electrophotographic development. 4,598,034, Cl. 430-106.600.

Horan, Ann C.: *See*—
Waitz, Jay A.; Patel, Mahesh G.; Marquez, Joseph A.; Kalyanpur, Manohar G.; and Horan, Ann C., 4,597,968, Cl. 424-118.000.

Hori, Shigekazu: *See*—
Watanabe, Shigeru; Tomita, Naotaka; and Hori, Shigekazu, 4,598,424, Cl. 455-327.000.

Horiai, Takayuki: *See*—
Tamura, Kunio; and Horiai, Takayuki, 4,597,314, Cl. 81-3.200.

Horie, Seiji: *See*—
Kawamura, Kouichi; Horie, Seiji; Makino, Naonori; and Sato, Hideo, 4,598,033, Cl. 430-75.000.

Horn, Peter; Bunsch, Hellmut; Gehm, Robert; and Marx, Matthias, to BASF Aktiengellschaft. Preparation of impact-resistant nylon molding materials by alkaline lactam polymerization. 4,598,125, Cl. 525-183.000.

Horner, Ronald F.: *See*—
Crane, David O.; McDonald, Thomas; and Horner, Ronald F., 4,597,296, Cl. 73-862.330.

Horton, Edward C.: *See*—
Eglise, David; and Horton, Edward C., 4,597,506, Cl. 221-6.000.

Horwell, David C., to Warner-Lambert Company. Substituted trans-1,2-diaminocyclohexyl amide compounds. 4,598,087, Cl. 514-429.000.

Hosaka, Sumio: *See*—
Terasawa, Tsuneo; Kuniyoshi, Shinji; Takanashi, Akihiro; Kurosaki, Toshiei; Kawamura, Yoshio; and Hosaka, Sumio, 4,597,669, Cl. 356-401.000.

Hoshen, Joseph, to AT&T Bell Laboratories. Scheme for reducing transmission delay following collision of transmissions in communication networks. 4,598,285, Cl. 340-825.500.

Hoshi, Tai: *See*—
Morita, Koyo; Nomura, Keizo; Nishizuka, Hiroshi; Hoshi, Tai; Tamiya, Yoichiro; and Asakawa, Terushige, 4,598,197, Cl. 250-205.000.

Hoshikawa, Jun, to Epson Corporation. Liquid crystal display device and a method of manufacturing the same from a folded plastic sheet. 4,597,635, Cl. 350-334.000.

Hoshikawa, Jun, to Seiko Epson Corporation. Liquid crystal display panel and a process for the production thereof. 4,597,636, Cl. 350-334.000.

Hosoya, Ryoji: *See*—
Takiguchi, Hiroshi; Sugiyama, Yoshikatu; and Hosoya, Ryoji, 4,597,484, Cl. 192-70.150.

Hospital for Sick Children, The: *See*—
Lingwood, Clifford A., 4,597,999, Cl. 427-54.100.

Houlihan, Thomas D.: *See*—
McGroarty, Joseph F.; and Houlihan, Thomas D., 4,598,177, Cl. 179-107.00E.

House Food Industrial Company Limited: *See*—
Sugisawa, Ko; Sekiguchi, Kazuya; Tsuzi, Kiyoaki; and Ono, Akinobu, 4,597,945, Cl. 422-113.000.

House, Roy F.; and Granquist, Victor M., to Venture Innovations, Inc. Polyphenolic acid adducts. 4,597,878, Cl. 252-8.50M.

Hovione Inter Ltd.: *See*—
Page, Philip R., 4,597,904, Cl. 260-351.500.

Howard, Philip H., to International Cube Corp. Low tack cationic microsphere glue. 4,598,112, Cl. 524-78.000.
Howell, Edward K., to General Electric Company. Current limiting circuit breaker. 4,598,187, Cl. 200-147.00R.
Hoyle, Charles E.: *See*—
Christie, Peter A.; and Hoyle, Charles E., 4,598,009, Cl. 428-172.000.
Hozelock-ASL Limited: *See*—
Caruana, Joseph, 4,597,528, Cl. 239-381.000.
HR Textron Inc.: *See*—
Bergloff, Raymond A.; and Hollis, James T., 4,597,548, Cl. 244-104.0FP.
Hsu, Ming-Ta S.: *See*—
Kourtides, Demetrius A.; Parker, John A.; and Hsu, Ming-Ta S., 4,598,007, Cl. 428-116.000.
Huck Manufacturing Company: *See*—
Corbett, Robert J., 4,597,263, Cl. 60-534.000.
Huckle, Ralph E., to De La Rue Systems Limited. Secure container. 4,597,340, Cl. 109-45.000.
Hudson, Alice P.: *See*—
Woodward, Fred E.; and Hudson, Alice P., 4,597,975, Cl. 424-150.000.
Hueber, Alfred: *See*—
Hagemeister, Klaus; and Hueber, Alfred, 4,597,436, Cl. 165-76.000.
Huffman, Samuel L.: *See*—
Littlejohn, Robert J., 4,597,585, Cl. 280-411.00C.
Huggins, Raymond W., to Xerox Corporation. Feedability sensor for a vacuum corrugated feeder with movable backstop. 4,597,570, Cl. 271-98.000.
Hughes Aircraft Company: *See*—
Dolan, Cyril F., 4,597,261, Cl. 60-223.000.
Kinkel, John F., 4,598,256, Cl. 330-302.000.
Scapple, Robert Y.; Peters, John W.; Linder, Jacques F.; and Yee, Edward M., 4,597,986, Cl. 427-53.100.
Hughes Tool Company: *See*—
Leuthen, John M., 4,598,353, Cl. 363-87.000.
Huinink, Heinrich: *See*—
Mauk, Gerhard; Huinink, Heinrich; Seitz, Hans; Frerichs, Udo; Rach, Heinz-Dieter; and Poque , Dionysius, 4,597,426, Cl. 152-379.500.
Hukill, Marlin E. Changeable display device. 4,597,209, Cl. 40-447.000.
Hullmann, Horst: *See*—
Kochy, Fritz; Brandel, Klaus; Hullmann, Horst; Neumann, Bernhard; and Helmsing, Gerhard, 4,597,461, Cl. 180-90.000.
Hundon Forge Limited: *See*—
Turley, Roger W., 4,597,753, Cl. 604-61.000.
Hunt, Arthur J.; and Hunt, Arthur J., Jr. Rotary liquid separation unit. 4,597,865, Cl. 210-179.000.
Hunt, Arthur J., Jr.: *See*—
Hunt, Arthur J.; and Hunt, Arthur J., Jr., 4,597,865, Cl. 210-179.000.
Hunter Douglas Inc.: *See*—
Anderson, Richard N., 4,597,427, Cl. 160-107.000.
Hunter, Joe S.; and Ruffin, Paul B., to United States of America, Army. Device for controlling optical fiber twist on a bobbin. 4,597,255, Cl. 57-62.000.
Husco International: *See*—
Wilke, Raud A., 4,597,410, Cl. 137-491.000.
Hutchinson, Thomas S., to Atlantic Richfield Company. Method for excavating a large diameter shaft into the earth and at least partially through an oil-bearing formation. 4,597,444, Cl. 166-302.000.
HWH Corporation: *See*—
Hanser, Paul E., 4,597,584, Cl. 280-6.00R.
Hydril Company: *See*—
Roche, Joseph R.; Alexander, Gabriel G.; and Carbaugh, William L., 4,597,447, Cl. 166-347.000.
Hydro Rene Allee Rene Leduc Azerailles: *See*—
Porel, Louis-Claude; and Cyphelly, Ivan, 4,597,483, Cl. 192-59.000.
Ibrahim, Adel A.; Linville, Kevin D.; and Mays, Jerry E. Device for removing objects from tubular body passages. 4,597,389, Cl. 128-328.000.
Ichikawa, Haruo, to Fuji Photo Film Co., Ltd. Apparatus for unwinding web roll. 4,597,316, Cl. 83-156.000.
Ichikawa, Seizo, to Bridgestone Tire Company Limited. Wire bead forming apparatus. 4,597,157, Cl. 29-564.800.
ICI Americas Inc.: *See*—
Stephen, John F.; Smith, Jerry H.; and Meshreki, Makram H., 4,598,113, Cl. 524-291.000.
Idel, Karsten: *See*—
Ostlinning, Edgar; Idel, Karsten; Eisermann, Wolfgang M.; and Freitag, Dieter, 4,598,144, Cl. 528-388.000.
Idemitsu Kosan Company Limited: *See*—
Iseya, Akira; Kita, Takekatsu; and Ikeda, Makoto, 4,597,881, Cl. 252-41.000.
Identrol: *See*—
Mann, Arthur S., 4,597,655, Cl. 354-121.000.
Ierardi, Joseph A.: *See*—
Staples, Robert E.; Ierardi, Joseph A.; and Golder, Willis E., 4,598,246, Cl. 324-73.0PC.
Igarashi, Noboru, to Sharp Kabushiki Kaisha. Construction of a heating compartment for cooking apparatus. 4,597,374, Cl. 126-19.00R.
Igarashi, Yuriko: *See*—
Okada, Yoshio; and Igarashi, Yuriko, 4,597,993, Cl. 427-150.000.
Igawa, Tatsuya: *See*—
Sato, Morio; and Igawa, Tatsuya, 4,597,829, Cl. 156-644.000.
Ignatuk, Daniel: *See*—
Lynch, Joseph A.; and Ignatuk, Daniel, 4,597,488, Cl. 198-339.100.
Iha, Kiyoshi, to Chamberlain Manufacturing Corporation. Two drum cable drive garage door opener. 4,597,428, Cl. 160-188.000.
IHC Holland N.V.: *See*—
van der Meer, Paulus; and Koert. Jan P., 4,597,200, Cl. 37-63.000.
Ikeda, Haruyoshi: *See*—
Yoshiura, Shoichiro; and Ikeda, Haruyoshi, 4,597,663, Cl. 355-14.00R.
Ikeda, Makoto: *See*—
Iseya, Akira; Kita, Takekatsu; and Ikeda, Makoto, 4,597,881, Cl. 252-41.000.
Ikegami, Yoshiki; and Sato, Yasuaki, to Fujitsu Limited. System for changing common card mode data in a card image data processing system. 4,598,284, Cl. 340-750.000.
Ikekita, Minoru, to Kabushiki Kaisha Ishida Koki Seisakusho. Electronic scale with CRT display. 4,597,457, Cl. 177-25.000.
Ikuma, Sadao; Aoki, Yuji; and Watanabe, Noboru, to Mitsubishi Monsanto Chemical Co. Heat resistant resin composition. 4,598,126, Cl. 525-194.000.
Illinois Tool Works Inc.: *See*—
Griffin, James L., 4,598,291, Cl. 340-870.370.
Imaging Sciences Associates Limited Partnership: *See*—
Luccio, Alfredo U.; and Brill, Bertrand A., 4,598,415, Cl. 378-119.000.
Imamura, Kanji: *See*—
Otake, Noboru; Kawai, Hiroyuki; Hayakawa, Yoichi; Nakagawa, Masaya; Imamura, Kanji; and Tanabe, Kozo, 4,598,146, Cl. 536-6.400.
Imaoka, Kazunori, to Fujitsu Limited. Methods of forming denuded zone in wafer by intrinsic gettering and forming bipolar transistor therein. 4,597,804, Cl. 148-1.500.
Imoto, Eiji: *See*—
Oboshi, Takamitsu; Koga, Tomoaki; and Imoto, Eiji, 4,597,168, Cl. 29-596.000.
Inagaki, Mitsuo: *See*—
Nakano, Hiromichi; Sasaya, Hideaki; and Inagaki, Mitsuo, 4,597,718, Cl. 417-300.000.
Inciong, Josefino T.; and Miszczak, Frank L., to Felt Products Mfg. Co. Gasket assembly for sealing covers to automotive engines. 4,597,583, Cl. 277-235.00B.
Ingenieurburo Leuenberger AG: *See*—
Berens, Ulrich, 4,598,114, Cl. 524-345.000.
Ingersoll Cutting Tool Company: *See*—
Johnson, William B., 4,597,695, Cl. 407-113.000.
Injeyan, Hagop; and Wang, John H. S., to United States of America, Air Force. CW HF R-branch laser. 4,598,409, Cl. 372-89.000.
Inmont Corporation: *See*—
Panush, Sol, 4,598,015, Cl. 428-324.000.
Panush, Sol, 4,598,020, Cl. 428-411.100.
Inokuchi, Haruhisa: *See*—
Sakai, Takami; and Inokuchi, Haruhisa, 4,598,350, Cl. 363-35.000.
Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi; Onoue, Makoto; and Sano, Sadao, 4,598,189, Cl. 219-69.00W.
Inoue, Kiyoshi; Onoue, Makoto; and Sano, Sadao, to Inoue-Japax Research Incorporated. Automatic wire-threading with a tubular electrode in a TW-E machine. 4,598,189, Cl. 219-69.00W.
Institut fuer Getreideverarbeitung im VEB Kombinat Nahrungsmittel und Kaffee: *See*—
Bottcher, Regina; Juhnke, Hubert; Kulawick, Gabriele; Zehle, Gunter; and Zosche, Helmut, 4,597,980, Cl. 426-568.000.
Institut Organicheckoi Khimii: *See*—
Efimov, Andrei S.; Melnik, Igor M.; Tkachuk, Jury V.; Tronko, Nikolai D.; Efimova, Elena K.; Obrosova, Irina G.; Gordienko, Vadim M.; Kaminsky, Leonid A.; Staninets, Vasily I.; Zborovsky, Jury L.; Mokhort, Nikolai A.; and Kirichek, Lora M., 4,598,081, Cl. 514-296.000.
International Business Machines Corporation: *See*—
Baldauf, Lawrence M.; Girvan, Edward J.; Overfield, Richard B.; and Roberts, Gilbert C., 4,597,177, Cl. 29-878.000.
Bayer, Thomas; Hinkel, Holger; Kleischmann, Kurt; Kuenzel, Ulrich; and Schafer, Rolf, 4,598,017, Cl. 428-336.000.
Carrington, James E.; and Westcott, Gerald R., 4,597,328, Cl. 101-93.130.
Chan, Yuen H., 4,598,390, Cl. 365-230.000.
Chellis, Leroy N., 4,597,996, Cl. 427-386.000.
Dean, Mark E.; and Moeller, Dennis L., 4,598,356, Cl. 364-200.000.
Freeouf, John L.; Jackson, Thomas N.; Oelhafen, Peter; Pettit, George D.; and Woodall, Jerry M., 4,597,825, Cl. 156-643.000.
Gum, Peter H.; Levin, Arthur L.; Smith, Ronald M.; and Wilson, John H., 4,598,364, Cl. 364-300.000.
Herron, Lester W.; and Nufer, Robert W., 4,598,107, Cl. 523-351.000.
Jen, Shen; and Kabelac, William J., 4,598,327, Cl. 360-77.000.
Shaw, Jerry C.; and VanKessel, Theodore G., 4,598,384, Cl. 364-900.000.
Tung, Min-Hsiung G.; and Yanagisawa, Hiroshi, 4,598,283, Cl. 340-731.000.
Woodworth, George K., 4,598,330, Cl. 361-13.000.
International Cube Corp.: *See*—
Howard, Philip H., 4,598,112, Cl. 524-78.000.
International Metals Reclamation Company, Inc., The: *See*—
Hanewald, Richard H.; and Pargeter, John K., 4,597,564, Cl. 266-274.000.

International Power Technology, Inc.: *See*—
Hamill, James; Digumarthi, Ramarao; Conlon, William; Cheng, Dau Y.; and Chang, Chun-Nan, 4,597,256, Cl. 60-39.050.
International Sanitary Ware Manuf. Cy.: *See*—
Van Marcke, Karel C., 4,597,404, Cl. 137-1.000.
International Standard Electric Corporation: *See*—
Narvhus, Ingar; and Mikalsen, Jan P., 4,598,352, Cl. 363-69.000.
Szechenyi, Kalman, 4,598,413, Cl. 375-116.000.
Wong, Andrew C., 4,598,293, Cl. 343-17.20R.
International Telephone and Telegraph Corporation: *See*—
Kraushaar, Robert J.; and Ward, Kevin B., 4,597,629, Cl. 350-1.500.
Internationale Octrooi Maatschappij "Octropa" B.V.: *See*—
Lok, Cornelis M.; and Ganguli, Keshab L., 4,597,908, Cl. 260-409.000.
Inventio AG: *See*—
Kindler, Gerhard; and Stanyard, Ray, 4,598,354, Cl. 364-174.000.
IODEP, Inc.: *See*—
Boys, Donald R., 4,597,847, Cl. 204-298.000.
Ipri, Alfred C., to RCA Corporation. Method of fabricating a polysilicon transistor with a high carrier mobility. 4,597,160, Cl. 29-571.000.
Isaacs, Bruce H., to Atlantic Richfield Company. Regeneration of soluble molybdenum catalysts from spent catalyst streams. 4,598,057, Cl. 502-24.000.
Isenberg, Arnold O., to Westinghouse Electric Corp. Method of making an electrode. 4,597,170, Cl. 29-623.500.
Iseya, Akira; Kita, Takekatsu; and Ikeda, Makoto, to Idemitsu Kosan Company Limited. Process for producing a lithium-soap grease. 4,597,881, Cl. 252-41.000.
Ishibashi, Yasushi: *See*—
Yoshioka, Susumu; Matsuo, Nobuo; Meguri, Nobuyasu; Murakami, Tadashi; Ishibashi, Yasushi; Matsuda, Kenichi; Suzuka, Teruo; Fukase, Satoshi; and Ohse, Hidetaka, 4,597,856, Cl. 208-112.000.
Ishige, Sadao: *See*—
Iwasaki, Masayuki; Maeda, Minoru; Shinozaki, Fumiaki; and Ishige, Sadao, 4,598,036, Cl. 430-270.000.
Ishikawa, Isao: *See*—
Kanda, Hiroshi; Ishikawa, Isao; Katakura, Kageyoshi; and Nakaya, Chitose, 4,597,293, Cl. 73-606.000.
Ishikawa, Junzo: *See*—
Matsuda, Koji; Takagi, Toshinori; and Ishikawa, Junzo, 4,598,231, Cl. 315-111.810.
Ishima, Kazumi: *See*—
Koike, Takahisa; Fukazawa, Takao; Ishima, Kazumi; Murai, Toshiharu; Itoh, Tadashi; Kato, Toshifumi; and Jinnai, Koichiro, 4,598,299, Cl. 346-75.000.
Ishino, Yoshiaki: *See*—
Hara, Yoshio; and Ishino, Yoshiaki, 4,598,041, Cl. 430-498.000.
Ishizumi, Kikuo; Antoku, Fujio; and Asami, Yukio, to Sumitomo Chemical Company, Limited. N-(substituted piperazinyl) alkylbicyclic succinimide derivatives. 4,598,078, Cl. 514-252.000.
Ispra Fibroptics Industries Herzlia Ltd.: *See*—
Jacobson, Amnon, 4,597,787, Cl. 65-3.120.
Itakura, Keiichi: *See*—
Zelinka, Richard J.; Itakura, Keiichi; Sims, Carl W.; and Kaplan, Bruce E., 4,598,049, Cl. 435-287.000.
Itamoto, Shigeru; Suzuki, Kiyoshi; and Yasuda, Kenji, to Fuji Photo Optical Co., Ltd. Attraction holding device. 4,597,569, Cl. 269-21.000.
Itek Corporation: *See*—
Dodge, Dennis W., 4,597,652, Cl. 354-7.000.
Ito, Masazumi: *See*—
Hirata, Sumiaki; Ito, Masazumi; and Shibazaki, Kenji, 4,597,662, Cl. 355-14.00R.
Ito Optical Industrial Co., Ltd.: *See*—
Makino, Kazuo; Matsumoto, Akira; and Kabeya, Hideo, 4,598,133, Cl. 526-322.000.
Ito, Satoru, to Murata Manufacturing Co., Ltd. Pyroelectric detector. 4,598,163, Cl. 136-213.000.
Itoh, Tadashi: *See*—
Koike, Takahisa; Fukazawa, Takao; Ishima, Kazumi; Murai, Toshiharu; Itoh, Tadashi; Kato, Toshifumi; and Jinnai, Koichiro, 4,598,299, Cl. 346-75.000.
ITT Corporation: *See*—
Andricos, Constantine, 4,598,252, Cl. 330-51.000.
Chea, Ramon C. W., Jr.; Keegan, Kevin C.; Pothuri, Reddeppa N.; and Lloyd, Albert H., Jr., 4,598,173, Cl. 179-18.0FA.
Doggett, Eric L., 4,598,398, Cl. 370-17.000.
Karbassiyoon, Kamran; Akers, Francis I.; Raplee, Larry J.; and Fletcher, Daniel G., 4,597,785, Cl. 65-2.000.
Predina, Joseph P.; and Roberts, Tim H., 4,598,217, Cl. 307-525.000.
Upp, Daniel C.; and Bartholomay, William G., 4,598,396, Cl. 370-27.000.
Iwai, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor substrate and method for manufacturing semiconductor device using the same. 4,597,166, Cl. 29-580.000.
Iwasaki, Eiji: *See*—
Shiraishi, Daiichi; Iwasaki, Eiji; and Fukumoto, Ryoichi, 4,597,223, Cl. 49-352.000.
Iwasaki, Masayuki; Maeda, Minoru; Shinozaki, Fumiaki; and Ishige, Sadao, to Fuji Photo Film Co., Ltd. Print-out compositions. 4,598,036, Cl. 430-270.000.
Iwata, Yoshiki; Kawase, Nobuo; Tanaka, Yoshinori; Miyake, Takashi; and Kawaura, Hiroshi, to Canon Kabushiki Kaisha. Weight detecting type sensor. 4,597,459, Cl. 177-210.00R.
Izawa, Hisao: *See*—
Hayashi, Yutaka; and Izawa, Hisao, 4,598,242, Cl. 318-640.000.
Izu, Masatsugu: *See*—
Nath, Prem; and Izu, Masatsugu, 4,598,306, Cl. 357-30.000.
Izumi, Kenkichi: *See*—
Okouchi, Isao; Izumi, Kenkichi; Takahashi, Sankichi; Mukai, Yasuteru; and Tomida, Akira, 4,597,871, Cl. 210-456.000.
J. B. Nottingham & Co., Inc.: *See*—
Lindner, Melvin; and Mackey, Ronald A., 4,597,620, Cl. 339-89.00R.
J. M. Voith GmbH: *See*—
Muller, Helmut; and Brosius, Klaus, 4,597,481, Cl. 192-58.00A.
Jackson, Thomas N.: *See*—
Freeouf, John L.; Jackson, Thomas N.; Oelhafen, Peter; Pettit, George D.; and Woodall, Jerry M., 4,597,825, Cl. 156-643.000.
Jacobson, Alfred G.: *See*—
Barlow, Carl S.; and Jacobson, Alfred G., 4,597,395, Cl. 128-80.00H.
Jacobson, Amnon, to Ispra Fibroptics Industries Herzlia Ltd. Manufacture of optical fibre preforms. 4,597,787, Cl. 65-3.120.
Jacobson, Arthur E.: *See*—
Rice, Kenner C.; Rafferty, Michael F.; Jacobson, Arthur E.; Contreras, Patricia; O'Donohue, Thomas L.; Lessor, Ralph A.; and Mattson, Mariena V., 4,598,153, Cl. 546-229.000.
Jacoby, Charles E., to SI Handling Systems, Inc. Turntable for a system of driverless vehicles. 4,597,334, Cl. 104-37.000.
James, Christopher D.; and McNeal, Norman E., to Burroughs Corporation. Easily repairable, low cost, high speed electromechanical assembly of integrated circuit die. 4,598,308, Cl. 357-81.000.
James, Houston F. Wall positioning device. 4,597,554, Cl. 248-542.000.
Janko, Albert B. Obstetric tractive device. 4,597,391, Cl. 128-361.000.
Jansma, Jon B., to General Electric Company. Method and apparatus for coating fluorescent lamp tubes. 4,597,984, Cl. 427-28.000.
Janssen Pharmaceutica N.V.: *See*—
Heeres, Jan; Backx, Leo J. J.; and Mostmans, Joseph A., 4,598,085, Cl. 514-383.000.
Janssen, Rolf P.: *See*—
Hennings, Detlev F. K.; Janssen, Rolf P.; and Reijnen, Piet, 4,598,055, Cl. 501-137.000.
Japan Metals and Chemicals Co., Ltd.: *See*—
Oku, Koichi; and Matsuura, Kiyoshi, 4,597,957, Cl. 423-594.000.
Japan Spectroscopic Co., Ltd.: *See*—
Sugiyama, Kenkichi; Saito, Muneo; and Wada, Akio, 4,597,943, Cl. 422-70.000.
Japan Styrene Paper Corporation: *See*—
Watanabe, Noboru; Tokoro, Hisao; and Ohhara, Syuichi, 4,598,001, Cl. 428-31.000.
Jasinski, Thomas J.; and Witt, August F., to Massachusetts Institute of Technology. Apparatus for growing crystals. 4,597,949, Cl. 422-249.000.
Jen, Shen; and Kabelac, William J., to International Business Machines Corporation. Servo control system using servo pattern time of flight for read/write head positioning in a magnetic recording system. 4,598,327, Cl. 360-77.000.
Jenekhe, Samson A.; and Fure, Barbara J., to Honeywell Inc. Complexes of poly (3,6-N-alkylcarbazolyl alkenes). 4,598,139, Cl. 528-248.000.
Jenkins, Thomas E.: *See*—
Goudy, Paul R., Jr.; Doolittle, William P.; Jenkins, Thomas E.; Beemster, Bernard J.; Roos, William N.; and Collins, Patrick V., 4,597,530, Cl. 239-452.000.
Jennerwein, Margaretha: *See*—
Schonenberger, Helmut; Wappes, Beate; Jennerwein, Margaretha; von Angerer, Erwin; and Engel, Jurgen, 4,598,091, Cl. 514-492.000.
Jennie, Fred, to Weatherby, Inc. Safety device for guns. 4,597,212, Cl. 42-70.00E.
Jewett, Bryce D., Sr. Apparatus for sharpening end mills. 4,597,226, Cl. 51-92.0ND.
Jiker System Aktiebolag: *See*—
Jostler, Jan, 4,598,421, Cl. 383-37.000.
Jinnai, Koichiro: *See*—
Koike, Takahisa; Fukazawa, Takao; Ishima, Kazumi; Murai, Toshiharu; Itoh, Tadashi; Kato, Toshifumi; and Jinnai, Koichiro, 4,598,299, Cl. 346-75.000.
Jipping, Max J.: *See*—
Roorda, Herm J.; and Jipping, Max J., 4,597,797, Cl. 106-194.000.
Johannsmeier, Karl-Heinz; and Phillips, Edward H., to Optimetrix Corporation. Step-and-repeat projection alignment and exposure system with auxiliary optical unit. 4,597,664, Cl. 355-43.000.
Johansen, Nils L.: *See*—
Lundt, Behrend F.; Jorgensen, Karin D.; Johansen, Nils L.; Gronvald, Frederik C.; Frandsen, Erik K.; Moody, Alister J.; and Markussen, Jan, 4,598,065, Cl. 514-12.000.
Johnsen & Jorgensen (Plastics) Ltd.: *See*—
Stubbs, Peter, 4,597,500, Cl. 215-256.000.
Johnson, Arthur F., to Energy Conservation Partnership, Ltd. Pollution control and heat recovery. 4,597,433, Cl. 165-4.000.
Johnson, Christopher P., III: *See*—
Shanklin, James R., Jr.; and Johnson, Christopher P., III, 4,597,902, Cl. 262-239.00B.
Johnson, David H., to United States of America, Energy. Salinity driven oceanographic upwelling. 4,597,360, Cl. 119-3.000.
Johnson, Joe W.: *See*—
Smith, James R., Sr.; and Smith, Martha J., 4,597,110, Cl. 2-408.000.

Johnson, LeRoy B., to Schmelzer Corporation. Two position control valve. 4,597,414, Cl. 137-625.250.
Johnson, Noble M.: *See*—
Chiang, Anne; and Johnson, Noble M., 4,598,305, Cl. 357-23.700.
Johnson, Robert G.: *See*—
Lax, Ronald G.; Johnson, Robert G.; Henningsen, Charles G.; and Ellis, J. Scott, 4,597,624, Cl. 339-143.00R.
Johnson, Robert L. Tape measure holster. 4,598,027, Cl. 428-542.800.
Johnson, Robert R.; and Ovshinsky, Stanford R., to Energy Conversion Devices, Inc. Method for making, parallel preprogramming or field programming of electronic matrix arrays. 4,597,162, Cl. 29-574.000.
Johnson, Roy A., to Mead Corporation, The. Method and apparatus for applying controlled heat to a group of articles disposed within a shrink film wrapper. 4,597,247, Cl. 53-557.000.
Johnson, Russell L., to Kimberly-Clark Corporation. Extendable hygienic pad. 4,597,759, Cl. 604-385.000.
Johnson, Thomas A.: *See*—
Ford, Michael E.; and Johnson, Thomas A., 4,597,911, Cl. 558-29.000.
Johnson, William B., to Ingersoll Cutting Tool Company. Face milling apparatus with eight-edged insert. 4,597,695, Cl. 407-113.000.
Jonas, Otakar. Detachable keel for small boats. 4,597,348, Cl. 114-140.000.
Jones, Charles E.; and Brabant, Bette-Jean, to FMC Corporation. Homogeneous laundry detergent slurries containing polymeric acrylic stabilizers. 4,597,889, Cl. 252-135.000.
Jones, Keith E.: *See*—
Grellmann, H. Erwin; Jones, Keith E.; and Wright, John A., 4,598,334, Cl. 361-290.000.
Jones, Paul, Jr., to Wingspread Corporation. Method of stiffening an insole during the cement lasting of footwear. 4,597,125, Cl. 12-142.00F.
Joppien, Hartmut: *See*—
Skotsch, Carlo; Joppien, Hartmut; and Pieroh, Ernst A., 4,598,083, Cl. 514-357.000.
Jorgensen, Karin D.: *See*—
Lundt, Behrend F.; Jorgensen, Karin D.; Johansen, Nils L.; Gronvald, Frederik C.; Frandsen, Erik K.; Moody, Alister J.; and Markussen, Jan, 4,598,065, Cl. 514-12.000.
Josefowicz, Jack Y., to Atlantic Richfield Company. Method and apparatus for production of a metal from metallic oxide ore. 4,597,839, Cl. 204-67.000.
Jostler, Jan, to Jiker System Aktiebolag. Belt having a succession of packaging blanks. 4,598,421, Cl. 383-37.000.
Joyce, Edward D., to F. W. Saybolt & Co. Inc. Apparatus for lowering and raising an article. 4,597,562, Cl. 254-334.000.
Juhnke, Hubert: *See*—
Bottcher, Regina; Juhnke, Hubert; Kulawick, Gabriele; Zehle, Gunter; and Zosche, Helmut, 4,597,980, Cl. 426-568.000.
Junker, Warren R.: *See*—
Brill, Bernard A., III; Junker, Warren R.; White, John K.; Rana, Iftikhar A.; Bevilacqua, Bruce W.; Cooper, Frank W., Jr.; and Taszarek, Bruce J., 4,597,294, Cl. 73-623.000.
Junklewitz, Hugo, to Th. Kieserling & Albrecht GmbH. & Co. Conveyor for transporting wheel rims during roll shaping. 4,597,489, Cl. 198-468.200.
Justrite Manufacturing Company: *See*—
Witt, Edward H., 4,597,504, Cl. 220-88.00R.
Juzefczyk, Adrienne L. Hair treatment apparatus. 4,597,191, Cl. 34-60.000.
Kaae, James L., to GA Technologies Inc. Lithium-containing neutron target particle. 4,597,936, Cl. 376-411.000.
Kabayama, Yoshiaki, to Kabushiki Kaisha Daikin Seisakusho. Clutch disc assembly with balancing means. 4,597,486, Cl. 192-107.00R.
Kabelac, William J.: *See*—
Jen, Shen; and Kabelac, William J., 4,598,327, Cl. 360-77.000.
Kabeya, Hideo: *See*—
Makino, Kazuo; Matsumoto, Akira; and Kabeya, Hideo, 4,598,133, Cl. 526-322.000.
Kabushiki Kaisha Copal Takeda Medical Kenyusho: *See*—
Yamakoshi, Ken-ichi; and Shimazu, Hideaki, 4,597,393, Cl. 128-677.000.
Kabushiki Kaisha Daikin Seasakusho: *See*—
Kamio, Takenori, 4,597,320, Cl. 91-465.000.
Kabushiki Kaisha Daikin Seisakusho: *See*—
Kabayama, Yoshiaki, 4,597,486, Cl. 192-107.00R.
Kitano, Seiichi; and Ono, Yukio, 4,597,479, Cl. 192-18.00R.
Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
Ikekita, Minoru, 4,597,457, Cl. 177-25.000.
Kabushiki Kaisha Meidensha: *See*—
Hiraki, Akio; Miyasato, Tatsuro; and Hayashi, Masao, 4,597,844, Cl. 204-192.00C.
Kabushiki Kaisha Takai-Rika-Denki-Seisakusho: *See*—
Yamamoto, Toshimasa; and Ando, Takayuki, 4,597,546, Cl. 242-107.40A.
Kabushiki Kaisha Toka-Rika-Denki-Seisakusho: *See*—
Mori, Shinji; and Tamura, Keiichi, 4,597,543, Cl. 242-107.40B.
Kabushiki Kaisha Toshiba: *See*—
Kobayashi, Hiroaki, 4,597,522, Cl. 228-179.000.
Majima, Shinichi; and Ogawa, Atsushi, 4,598,244, Cl. 323-351.000.
Moriya, Takahiko; and Nakada, Saburo, 4,597,167, Cl. 29-590.000.
Obata, Yoshiharu; Noji, Takashi; Sugiyama, Masahiro; and Kawamura, Shigeharu, 4,598,228, Cl. 313-475.000.
Ono, Ken'ichi, 4,598,300, Cl. 346-76.0PH.
Sakai, Takami; and Inokuchi, Haruhisa, 4,598,350, Cl. 363-35.000.
Shinada, Kazuyoshi; and Sato, Masaki, 4,597,824, Cl. 156-643.000.
Sudo, Hajime, 4,597,613, Cl. 308-10.000.
Usami, Toshiro; Mikata, Yuuichi; and Shinada, Kazuyoshi, 4,597,159, Cl. 29-571.000.
Watanabe, Shigeru; Tomita, Naotaka; and Hori, Shigekazu, 4,598,424, Cl. 455-327.000.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Tachikawa, Hideo; Suzuki, Takatoshi; Fujita, Hironori; and Arai, Tohru, 4,597,808, Cl. 148-20.300.
Kabushiki Kaisha Universal: *See*—
Nishikawa, Ikuo, 4,597,309, Cl. 74-575.000.
Kacalieff, Christ D.; and Causey, Charles E., to Chris Kaye Plastics Corp. Hose connector. 4,597,594, Cl. 285-239.000.
Kadija, Igor V.: *See*—
Haque, Reza; Smith, Edward F., III; and Kadija, Igor V., 4,598,022, Cl. 428-413.000.
Kahn, Karen F.: *See*—
Doster, Robert C.; and Kahn, Karen F., 4,597,976, Cl. 426-325.000.
Kaiser Aluminum & Chemical Corporation: *See*—
Webster, Donald, 4,597,792, Cl. 75-249.000.
Kaizaki, Michikazu. Device for preventing an endless track vehicle from damaging a paved road surface. 4,597,612, Cl. 305-51.000.
Kakei, Tsutomu: *See*—
Oda, Kazutaka; Kon, Yoshio; and Kakei, Tsutomu, 4,597,837, Cl. 204-14.100.
Kallfass, Karl-Heinz, to Kallfass Verpackungsmaschinen GmbH. Shrinking tunnel. 4,597,193, Cl. 34-224.000.
Kallfass Verpackungsmaschinen GmbH: *See*—
Kallfass, Karl-Heinz, 4,597,193, Cl. 34-224.000.
Kalyanpur, Manohar G.: *See*—
Waitz, Jay A.; Patel, Mahesh G.; Marquez, Joseph A.; Kalyanpur, Manohar G.; and Horan, Ann C., 4,597,968, Cl. 424-118.000.
Kamata, Masami; Tabushi, Iwao; Morimoto, Saichi; Asaeda, Takashi; and Aoki, Yoshikazu, to Tachikawa Research Institute. Method for dissolving cellulose in organic solvents and resulting cellulose solutions. 4,597,798, Cl. 106-203.000.
Kamei, Tadashi: *See*—
Aoyama, Takeo; Magara, Syoji; Yokoyama, Shigeki; Kamei, Tadashi; and Uehara, Mikio, 4,597,818, Cl. 156-308.200.
Kamijo, Eiji: *See*—
Yamakawa, Akira; and Kamijo, Eiji, 4,598,053, Cl. 501-104.000.
Kaminski, David C.: *See*—
Weis, Philip J.; Cook, Richard; Kaminski, David C.; and Smith, James E., 4,597,301, Cl. 74-15.860.
Kaminsky, Leonid A.: *See*—
Efimov, Andrei S.; Melnik, Igor M.; Tkachuk, Jury V.; Tronko, Nikolai D.; Efimova, Elena K.; Obrosova, Irina G.; Gordienko, Vadim M.; Kaminsky, Leonid A.; Staninets, Vasily I.; Zborovsky, Jury L.; Mokhort, Nikolai A.; and Kirichek, Lora M., 4,598,081, Cl. 514-296.000.
Kamio, Takenori, to Kabushiki Kaisha Daikin Seasakusho. Diaphragm type vacuum actuator. 4,597,320, Cl. 91-465.000.
Kanazawa, Minoru: *See*—
Miyoshi, Takahito; Masuyama, Kenichi; Okutu, Toshimitu; Utumi, Masahiro; Fujiyama, Masaaki; and Kanazawa, Minoru, 4,598,014, Cl. 428-323.000.
Kanbe, Osami: *See*—
Matsunaga, Katsuo; Kanbe, Osami; and Otaki, Hiroyuki, 4,598,222, Cl. 310-198.000.
Kanda, Hiroshi; Ishikawa, Isao; Katakura, Kageyoshi; and Nakaya, Chitose, to Hitachi, Ltd. Scanning acoustic microscope. 4,597,293, Cl. 73-606.000.
Kaneaki, Tetsuhiko: *See*—
Nikaido, Masataka; Kawamoto, Kinji; Murase, Kazuhiro; Kaneaki, Tetsuhiko; Adachi, Tatsuya; and Matsuda, Sakurako, 4,597,318, Cl. 84-1.220.
Kanebo Ltd.: *See*—
Koyama, Hiroaki; and Shimizu, Shigeo, 4,598,110, Cl. 523-446.000.
Kaneko, Yoshiaki: *See*—
Saito, Toshiyuki; Okubo, Naofumi; Kaneko, Yoshiaki; and Tokumitsu, Yasuyuki, 4,598,254, Cl. 330-286.000.
Kanner, Rowland W.: *See*—
Rabenau, Richard; and Kanner, Rowland W., 4,597,399, Cl. 134-184.000.
Kaplan, Bruce E.: *See*—
Zelinka, Richard J.; Itakura, Keiichi; Sims, Carl W.; and Kaplan, Bruce E., 4,598,049, Cl. 435-287.000.
Kaplan, Lester J.: *See*—
Szmuszkovicz, Jacob; McCall, John M.; Kaplan, Lester J.; and McMillan, Moses W., 4,598,088, Cl. 514-429.000.
Kaplan, Steve E., to Pioneer Products, Inc. Frictional grip tool holder. 4,597,496, Cl. 211-70.600.
Karanewsky, Donald S., to E. R. Squibb & Sons, Inc. Certain 3-phosphinyl-amino-2-oxo-1H-azocine or azonine-1-acetic acid derivatives having anti-hypertensive properties. 4,598,071, Cl. 514-79.000.
Karbassiyoon, Kamran; Akers, Francis I.; Raplee, Larry J.; and Fletcher, Daniel G., to ITT Corporation. Method of and apparatus for making optical preforms with a predetermined cladding/core ratio. 4,597,785, Cl. 65-2.000.
Kariyone, Kazuo: *See*—
Takagi, Hirofumi; Kunugita, Kiyohiko; Sawai, Hideki; and Kariyone, Kazuo, 4,598,066, Cl. 514-18.000.
Karl Mengele & Sohne GmbH & Co.: *See*—
Blumer, Leo; and Lenzer, Xaver, 4,597,253, Cl. 56-13.400.
Karlsson, Kurt: *See*—
Soderlund, Frits; and Karlsson, Kurt, 4,597,726, Cl. 418-201.000.

Kasai, Shigeo, to Amada Metrecs Company, Limited. Tapping machine. 4,597,145, Cl. 29-51.000.
Kassai Kabushikikaisha: *See—*
Kassai, Kenzou, 4,597,116, Cl. 5-99.00A.
Kassai, Kenzou, to Kassai Kabushikikaisha. Bed for baby carriages. 4,597,116, Cl. 5-99.00A.
Kastin, Howard. Soft candy composition. 4,597,981, Cl. 426-660.000.
Katakura, Kageyoshi: *See—*
Kanda, Hiroshi; Ishikawa, Isao; Katakura, Kageyoshi; and Nakaya, Chitose, 4,597,293, Cl. 73-606.000.
Katakura, Yoshiaki: *See—*
Nishitani, Akito; and Katakura, Yoshiaki, 4,597,827, Cl. 156-643.000.
Kataoka, Hiroyuki: *See—*
Leng, Svay; Suganuma, Saburo; and Kataoka, Hiroyuki, 4,597,660, Cl. 355-3.0SH.
Katayama, Sunao: *See—*
Hiramatsu, Tadao; and Katayama, Sunao, 4,598,375, Cl. 364-569.000.
Kato, Motokazu: *See—*
Matsumoto, Toshio; and Kato, Motokazu, 4,598,402, Cl. 371-38.000.
Kato, Toshifumi: *See—*
Koike, Takahisa; Fukazawa, Takao; Ishima, Kazumi; Murai, Toshiharu; Itoh, Tadashi; Kato, Toshifumi; and Jinnai, Koichiro, 4,598,299, Cl. 346-75.000.
Katou, Hitoshi: *See—*
Takagi, Kazunori; Soma, Hiroshi; Miyata, Yoshiaki; Motozawa, Yasuki; and Katou, Hitoshi, 4,597,470, Cl. 181-141.000.
Kaule, Wittich; and Stenzel, Gerhard, to GAO Gesellschaft fur Automation und Organisation mbH. Security paper with authenticity features in the form of substances luminescing only in the invisible region of the optical spectrum and process for testing the same. 4,598,205, Cl. 250-458.100.
Kawada, Yasuyuki: *See—*
Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, 4,597,879, Cl. 252-8.55D.
Kawaguchi, Fumio: *See—*
Umetani, Keiji; Suzuki, Atsushi; Nakagawa, Manabu; Yoshida, Minoru; Kawaguchi, Fumio; Yamada, Hiromichi; and Koike, Kouichi, 4,598,203, Cl. 250-366.000.
Kawaguchi, Hiroshi; Nishina, Shuho; Nakanishi, Nobuyasu; and Honda, Yukio, to Toyota Jidosha Kabushiki Kaisha. Foot-operated control device for parking brake. 4,597,307, Cl. 74-512.000.
Kawahara, Masahiro: *See—*
Ohwaki, Takayuki; Sakashita, Shigeru; Kawahara, Masahiro; Shinoda, Aishin; and Miyake, Yasuo, 4,598,070, Cl. 514-58.000.
Kawai, Hiroyuki: *See—*
Otake, Noboru; Kawai, Hiroyuki; Hayakawa, Yoichi; Nakagawa, Masaya; Imamura, Kanji; and Tanabe, Kozo, 4,598,146, Cl. 536-6.400.
Kawai, Osamu, to NSK-Warner K.K. Device for adjusting webbing-supporting position. 4,597,588, Cl. 280-808.000.
Kawai, Shinji: *See—*
Hirashiba, Yuji; Kawai, Shinji; and Oguma, Tomio, 4,597,111, Cl. 4-420.400.
Kawakami, Chikuni, to Fuji Photo Film Co., Ltd. Direct-current power supply with alarm indicator. 4,598,243, Cl. 323-349.000.
Kawamoto, Kinji: *See—*
Nikaido, Masataka; Kawamoto, Kinji; Murase, Kazuhiro; Kaneaki, Tetsuhiko; Adachi, Tatsuya; and Matsuda, Sakurako, 4,597,318, Cl. 84-1.220.
Kawamura, Hiroyuki: *See—*
Fujii, Setsuro; Sato, Takuo; Kawamura, Hiroyuki; Yaegashi, Takashi; Kurumi, Masateru; and Aoyama, Takuo, 4,598,077, Cl. 514-233.000.
Kawamura, Kouichi; Horie, Seiji; Makino, Naonori; and Sato, Hideo, to Fuji Photo Film Co., Ltd. Photoconductive compositions comprising a disazo compound. 4,598,033, Cl. 430-75.000.
Kawamura, Shigeharu: *See—*
Obata, Yoshiharu; Noji, Takashi; Sugiyama, Masahiro; and Kawamura, Shigeharu, 4,598,228, Cl. 313-475.000.
Kawamura, Yoshio: *See—*
Terasawa, Tsuneo; Kuniyoshi, Shinji; Takanashi, Akihiro; Kurosaki, Toshiei; Kawamura, Yoshio; and Hosaka, Sumio, 4,597,669, Cl. 356-401.000.
Kawasaki, Shozo: *See—*
Ando, Akio; Ochiai, Toshihiko; Nakanishi, Masae; Kawasaki, Shozo; and Nishida, Katsutoshi, 4,597,926, Cl. 264-67.000.
Kawasaki Steel Corporation: *See—*
Takagi, Kiyoshi; Toda, Ichiro; Hamasaki, Yoshiharu; and Wakamiya, Yoshinori, 4,598,377, Cl. 364-472.000.
Kawase, Nobuo: *See—*
Iwata, Yoshiki; Kawase, Nobuo; Tanaka, Yoshinori; Miyake, Takashi; and Kawaura, Hiroshi, 4,597,459, Cl. 177-210.00R.
Kawashima, Mikio, to Hitachi Elevator Engineering & Service Co., Ltd. Process for regenerating a man conveyor handrail. 4,597,992, Cl. 427-140.000.
Kawaura, Hiroshi: *See—*
Iwata, Yoshiki; Kawase, Nobuo; Tanaka, Yoshinori; Miyake, Takashi; and Kawaura, Hiroshi, 4,597,459, Cl. 177-210.00R.
Kayen, Samuel L.: *See—*
Smilow, George; and Kayen, Samuel L., 4,597,207, Cl. 40-20.00R.
Kazuno, Youzo: *See—*
Nishimura, Tamio; Toku, Hiroshige; Yoshii, Shin; Fukuyasu, Harumi; Matsumoto, Kuniomi; Kazuno, Youzo; and Watanabe, Tetsuro, 4,598,095, Cl. 514-632.000.
Keefer, Donald W.: *See—*
Fogel, Isaac; and Keefer, Donald W., 4,597,120, Cl. 5-451.000.
Keegan, Kevin C.: *See—*
Chea, Ramon C. W., Jr.; Keegan, Kevin C.; Pothuri, Reddeppa N.; and Lloyd, Albert H., Jr., 4,598,173, Cl. 179-18.0FA.
Keeney, L. W. Method and apparatus for preventing fluid runovers from a well. 4,597,449, Cl. 166-373.000.
Keggenhoff, Berthold; Mahlmann, Enno; Eifler, Willi; and Ellendt, Gunther, to Bayer Aktiengesellschaft. Process for the production of polyisocyanates. 4,597,909, Cl. 560-347.000.
Keithley Instruments, Inc.: *See—*
Reindel, Kenneth A.; and Mego, Thomas J., 4,598,253, Cl. 330-253.000.
Keller, Howard J.: *See—*
Boothroyd, Donald C.; Norman, Robert W., Jr.; and Keller, Howard J., 4,598,365, Cl. 364-200.000.
Kelsey-Hayes Company: *See—*
Parker, Wendell E., 4,597,245, Cl. 53-510.000.
Rozmus, Walter J., 4,597,730, Cl. 425-78.000.
Kelson, Larry J.: *See—*
Swenson, Robert E.; Hanson, Merlin L.; and Kelson, Larry J., 4,598,357, Cl. 364-200.000.
Kemeny, George A., to Westinghouse Electric Corp. Current limiting apparatus utilizing multiple resistive parallel rails. 4,598,332, Cl. 361-58.000.
Kemper, Hermanus C.: *See—*
Goedhart, Machiel; Gortemaker, Franciscus H.; Kemper, Hermanus C.; and Kielman, Hendrik S., 4,597,886, Cl. 252-95.000.
Kenkare, Divaker B.: *See—*
Colodney, Daniel; and Kenkare, Divaker B., 4,597,887, Cl. 252-106.000.
Kennedy, Dori-Jayne. Tool for removing frame clips. 4,597,148, Cl. 29-230.000.
Kennedy, Peter; and Parkinson, Kenneth, to United Kingdom Atomic Energy Authority. Production of reaction-bonded silicon carbide bodies. 4,597,923, Cl. 264-29.400.
Keogh, Michael J.; and Williams, Gary H., to Union Carbide Corporation. Scorch resistant compositions based on water-curable thermoplastic polymers having hydrolyzable, pendant silane moieties, and organo titanates. 4,598,116, Cl. 524-398.000.
Keratometer Research and Development: *See—*
Feldon, Steven E.; Broome, Barry G.; and Wallace, David A., 4,597,648, Cl. 351-212.000.
Kerr, William J.: *See—*
Andreescu, George; Clark, Dennis E.; and Kerr, William J., 4,598,074, Cl. 514-196.000.
Kerr, William T., to Maximma Consumer Technologies, Inc. Automatic ice-making system. 4,597,270, Cl. 62-138.000.
Kessels, Jozef L. W.; Schoenmakers, Wijnand J.; and Vrielink, Hendrik, to U.S. Philips Corporation. Device for associative searching in a sequential data stream composed of data records. 4,598,385, Cl. 364-900.000.
Khera, Muhammad I.: *See—*
Perry, Thomas J.; and Khera, Muhammad I., 4,598,404, Cl. 371-49.000.
Kiehlbauch, Richard A.: *See—*
Hansen, Frederick C.; and Kiehlbauch, Richard A., 4,598,118, Cl. 524-517.000.
Kielman, Hendrik S.: *See—*
Goedhart, Machiel; Gortemaker, Franciscus H.; Kemper, Hermanus C.; and Kielman, Hendrik S., 4,597,886, Cl. 252-95.000.
Kiessling, Rainer; Plzak, Voitech; and Wendt, H., to Hagen Batterie AG. Process of recovering lead from old lead accumulator scrap and reduction plate for this process. 4,597,841, Cl. 204-115.000.
Kihara, Hiroyuki, to Citizen Watch Co., Ltd. Analogue type timer. 4,597,673, Cl. 368-80.000.
Kihara, Jyun-ichi: *See—*
Kinjo, Morishige; Kihara, Jyun-ichi; and Aoyagi, Keizo, 4,598,362, Cl. 364-200.000.
Kihn, Harry; and Ackman, C. F. Douglas, to Cabot Medical Corporation. Method of coagulating muscle tissue. 4,597,379, Cl. 128-1.00R.
Kikkawa, Katsumasa: *See—*
Sensui, Hideyuki; Suzuka, Susumu; Gonda, Michihiro; and Kikkawa, Katsumasa, 4,597,795, Cl. 106-21.000.
Kikuchi, Takeshi: *See—*
Hamada, Masami; Tanaka, Kiyokazu; Kikuchi, Takeshi; Asai, Yasuhiro; Hayashi, Chihiro; and Ohtake, Fumio, 4,597,278, Cl. 72-187.000.
Killer, Eric; and Scherer, Gunther, to BBC Brown, Boveri & Company, Ltd. Depassivation layer on an electrode of an electrochemical cell. 4,597,846, Cl. 204-290.00F.
Kilmer, Paul R.; and Chapin, David S., to Cooper Industries, Inc. Drive unit with self-aligning gearing system. 4,597,453, Cl. 173-171.000.
Kim, Il Y. Plastic pan having a refrigerator support. 4,597,269, Cl. 62-286.000.
Kim, Sun H., to Biomeasure, Inc. Antiulcer compounds. 4,598,067, Cl. 514-19.000.
Kim, Young B.: *See—*
Efron, Edward; McPherson, James O.; and Kim, Young B., 4,598,324, Cl. 358-341.000.

Kimball, John B.: *See*—
Hoffman, Leonard M.; and Kimball, John B., 4,597,332, Cl. 102-505.000.

Kimberly-Clark Corporation: *See*—
Johnson, Russell L., 4,597,759, Cl. 604-385.000.

Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, to Asahi Kasei Kogyo Kabushiki Kaisha. Intermediates for fluorinated cation exchange membrane. 4,597,913, Cl. 558-436.000.

Kimura, Akira; and Murata, Kousaku. Mutant strain of *Escherichia coli* and its use for the preparation of glutathione. 4,598,046, Cl. 435-70.000.

Kimura, Saburo, to Toyoda Gosei Co., Ltd. Core bar of steering wheel. 4,598,002, Cl. 428-36.000.

Kindler, Gerhard; and Stanyard, Ray, to Inventio AG. Data input and output device for a drive regulation apparatus operated by a digital computer. 4,598,354, Cl. 364-174.000.

King, Daniel L., to United Technologies Corporation. Compressor vane gage. 4,597,187, Cl. 33-552.000.

King, Peter F., to Parker Chemical Company. Cleaner for steel cans. 4,597,888, Cl. 252-135.000.

King Seeley Thermos Co. (Halsey Taylor Div.): *See*—
Cushman, Robert L.; Koester, Arlan; and Eveland, Michael, 4,597,525, Cl. 239-28.000.

Kinjo, Morishige; Kihara, Jyun-ichi; and Aoyagi, Keizo, to Tokyo Shibaura Denki Kabushiki Kaisha. Buffer apparatus for controlling access requests among plural memories and plural accessing devices. 4,598,362, Cl. 364-200.000.

Kinkel, John F., to Hughes Aircraft Company. Tuned phase stable limiter amplifier. 4,598,256, Cl. 330-302.000.

Kirby, Trevor. Folding semi-rigid inflatable boat. 4,597,355, Cl. 114-345.000.

Kiriake, Masaharu, to Murata Kikai Kabushiki Kaisha. Bobbin supplying device in automatic winder. 4,597,540, Cl. 242-35.50A.

Kirichek, Lora M.: *See*—
Efimov, Andrei S.; Melnik, Igor M.; Tkachuk, Jury V.; Tronko, Nikolai D.; Efimova, Elena K.; Obrosova, Irina G.; Gordienko, Vadim M.; Kaminsky, Leonid A.; Staninets, Vasily I.; Zborovsky, Jury L.; Mokhort, Nikolai A.; and Kirichek, Lora M., 4,598,081, Cl. 514-296.000.

Kirin Beer Kabushiki Kaisha: *See*—
Otake, Noboru; Kawai, Hiroyuki; Hayakawa, Yoichi; Nakagawa, Masaya; Imamura, Kanji; and Tanabe, Kozo, 4,598,146, Cl. 536-6.400.
Tamura, Kunio; and Horiai, Takayuki, 4,597,314, Cl. 81-3.200.

Kirk, Kenneth L., to Amtrol Inc. Diaphragm valve. 4,597,559, Cl. 251-144.000.

Kise, Jay R., to O. M. Scott & Sons Company, The. Material spreader. 4,597,531, Cl. 239-650.000.

Kita, Takekatsu: *See*—
Iseya, Akira; Kita, Takekatsu; and Ikeda, Makoto, 4,597,881, Cl. 252-41.000.

Kitahara, Makoto: *See*—
Honjo, Takeshi; Kitahara, Makoto; Suzuki, Yasumichi; and Takahata, Naomi, 4,598,323, Cl. 358-285.000.

Kitano, Seiichi; and Ono, Yukio, to Kabushiki Kaisha Daikin Seisakusho. Clutch and brake unit. 4,597,479, Cl. 192-18.00R.

Kitayama, Yukio; Ochiai, Izumi; Nozawa, Yoshio; Miyagi, Masahiro; Ayabe, Tadaaki; and Uehara, Katsuharu, to Hitachi, Ltd. Tube-enlarging press for use in heat exchanger fabrication. 4,597,171, Cl. 29-727.000.

Kitrell, John V. Decorative item and method of making the same. 4,597,210, Cl. 40-542.000.

Klann, Horst. Pressing tool for securing screw connections. 4,597,284, Cl. 72-407.000.

Klatt, Alfred, to WABCO Westinghouse Fahrzeugbremsen GmbH. Gearshift selection system for a power-assisted transmission. 4,598,374, Cl. 364-424.100.

Klatt, William M., to American Medical Systems, Inc. Method and apparatus for packaging a fluid containing prosthesis. 4,597,765, Cl. 623-11.000.

Kleeman, Jeff. Remote controlled illumination equipment. 4,598,345, Cl. 362-233.000.

Klein, Joseph T.: *See*—
Davis, Larry; and Klein, Joseph T., 4,598,152, Cl. 546-198.000.

Kleischmann, Kurt: *See*—
Bayer, Thomas; Hinkel, Holger; Kleischmann, Kurt; Kuenzel, Ulrich; and Schafer, Rolf, 4,598,017, Cl. 428-336.000.

Klett, Dittmar: *See*—
Burkhardt, Joachim; Dreyer, Manfred; Klett, Dittmar; and Weyl, Helmut, 4,597,849, Cl. 204-424.000.

Klocke, Donald J. Log construction device. 4,597,230, Cl. 52-233.000.

Knapp, Frank T.: *See*—
Gendron, Wilfred H.; and Knapp, Frank T., 4,597,591, Cl. 283-1.00B.

Knapp, Heinrich: *See*—
Hafner, Udo; and Knapp, Heinrich, 4,597,558, Cl. 251-129.150.

Knepper, Jay C.: *See*—
York, Earl D.; Knepper, Jay C.; and Forgac, John M., 4,597,852, Cl. 208-427.000.

Kniffin, Melvin J.: *See*—
Anderson, David A. K.; Gilpin, James B.; and Kniffin, Melvin J., 4,597,175, Cl. 29-827.000.

Knizia, Klaus: *See*—
Schuster, Ernst; and Knizia, Klaus, 4,597,257, Cl. 60-39.120.

Knoedler, Norman R.: *See*—
Singh, Anand P.; and Knoedler, Norman R., 4,597,729, Cl. 425-38.000.

Knoll, Frank: *See*—
Spinosa, Dominic J.; and Knoll, Frank, 4,597,498, Cl. 212-189.000.

Knosby, Austin T. Livestock identification system. 4,597,495, Cl. 209-3.300.

Knothe, Erich; Melcher, Franz-Josef; and Oldendorf, Christian, to Sartorius GmbH. Electric balance with adjustable relative precision. 4,597,458, Cl. 177-164.000.

Knox, Richard H., to Camco, Incorporated. Well subsurface safety valve. 4,597,445, Cl. 166-319.000.

Kobayashi, Hiroaki, to Kabushiki Kaisha Toshiba. Wire bonding method and device. 4,597,522, Cl. 228-179.000.

Kobayashi, Satoshi: *See*—
Awane, Misao; Hara, Seiji; and Kobayashi, Satoshi, 4,598,379, Cl. 364-479.000.

Kobayashi, Takeo: *See*—
Takagi, Nobuo; Konno, Masakazu; and Kobayashi, Takeo, 4,597,958, Cl. 423-633.000.

Kochloefl, Karel: *See*—
Schneider, Michael; Kochloefl, Karel; and Bock, Ortwin, 4,598,061, Cl. 502-303.000.
Schneider, Michael; Pohl, Joachim; Kochloefl, Karel; and Bock, Ortwin, 4,598,062, Cl. 502-306.000.

Kochy, Fritz; Brandel, Klaus; Hullmann, Horst; Neumann, Bernhard; and Helmsing, Gerhard, to General Motors Corporation. Vehicle having pre-assembled constructional unit for the cockpit region thereof. 4,597,461, Cl. 180-90.000.

Kodama, Roy K.: *See*—
Zaghi, Hooshmand; and Kodama, Roy K., 4,597,151, Cl. 29-421.00R.

Koechner, Walter. Nuclear and pressure sensitive line/perimeter detection system. 4,598,202, Cl. 250-366.000.

Koehring Morgan: *See*—
Aberegg, Richard E., 4,597,497, Cl. 212-147.000.

Koert, Jan P.: *See*—
van der Meer, Paulus; and Koert, Jan P., 4,597,200, Cl. 37-63.000.

Koester, Arlan: *See*—
Cushman, Robert L.; Koester, Arlan; and Eveland, Michael, 4,597,525, Cl. 239-28.000.

Koga, Tomoaki: *See*—
Oboshi, Takamitsu; Koga, Tomoaki; and Imoto, Eiji, 4,597,168, Cl. 29-596.000.

Kohe Steel, Ltd.: *See*—
Misaka, Takaaki; Furukawa, Takeshi; Onuma, Eiichi; Obana, Hiroshi; Fukuyama, Kyosuke; Tanaka, Toshiyuki; Murata, Hiroyuki; and Shimojima, Katuhiko, 4,597,537, Cl. 241-79.100.

Koike, Kouichi: *See*—
Umetani, Keiji; Suzuki, Atsushi; Nakagawa, Manabu; Yoshida, Minoru; Kawaguchi, Fumio; Yamada, Hiromichi; and Koike, Kouichi, 4,598,203, Cl. 250-366.000.

Koike, Takahisa; Fukazawa, Takao; Ishima, Kazumi; Murai, Toshiharu; Itoh, Tadashi; Kato, Toshifumi; and Jinnai, Koichiro, to Ricoh Company, Ltd. Deflection control ink jet printing apparatus. 4,598,299, Cl. 346-75.000.

Koito Manufacturing Co., Ltd.: *See*—
Wada, Kiyoshi; Takeda, Hitoshi; Shibata, Hiroki; Toda, Atsushi; Yokoyama, Nobumi; and Yamada, Naohiro, 4,598,237, Cl. 318-16.000.

Kokusai Denshin Denwa Co., Ltd.: *See*—
Nakai, Tetsuya; Mimura, Yoshinori; Shinbori, Osamu; and Tokiwa, Hideharu, 4,597,786, Cl. 65-2.000.

Komatsubara, Michimasa; Fukami, Takeshi; Sakamoto, Akira; Sugita, Takehiro; and Miyata, Toshiya, to Sony Corporation. System for detecting a marker signal inserted in an information signal. 4,598,169, Cl. 178-22.040.

Kon, Yoshio: *See*—
Oda, Kazutaka; Kon, Yoshio; and Kakei, Tsutomu, 4,597,837, Cl. 204-14.100.

Konig, Klaus; and Heitkamper, Peter, to Bayer Aktiengesellschaft. Bis-(4-isocyanatophenoxy)-alkanes and a process for the production thereof. 4,597,910, Cl. 560-359.000.

Konno, Masakazu: *See*—
Takagi, Nobuo; Konno, Masakazu; and Kobayashi, Takeo, 4,597,958, Cl. 423-633.000.

Koruthu, John. Tidal energy system. 4,598,211, Cl. 290-53.000.

Kosof, Max E. Method of playing a bowling game. 4,597,575, Cl. 273-37.000.

Kosonocky, Walter F.: *See*—
Elabd, Hammam; and Kosonocky, Walter F., 4,598,321, Cl. 358-213.000.

Kotani, Kunio; Hayashi, Akio; and Taniguchi, Seiho, to Union Carbide Corporation. Compositions based on mixtures of ethylene-ethyl acrylate copolymers and ethylene-vinyl acetate-vinyl chloride terpolymers. 4,598,127, Cl. 525-229.000.

Kouge, Shinichi: *See*—
Morishita, Mitsuharu; and Kouge, Shinichi, 4,598,373, Cl. 364-424.000.

Kourtides, Demetrius A.; Parker, John A.; and Hsu, Ming-Ta S., to United States of America, National Aeronautics and Space Administration. Light weight fire resistant graphite composites. 4,598,007, Cl. 428-116.000.

Kovacevich, Sam, Jr. Wine distribution method and apparatus. 4,597,422, Cl. 141-85.000.

Kovats, Lawrence H. G., to Athey Products Corporation. Trash collection vehicle side-loading apparatus. 4,597,710, Cl. 414-409.000.

Koyama, Hiroaki; and Shimizu, Shigeo, to Kanebo Ltd. Resin composition containing granular or powdery phenol-aldehyde resin. 4,598,110, Cl. 523-446.000.

Koyama, Isao; and Hatsuse, Toshikazu, to Citizen Watch Co., Ltd. Vacuum suction device. 4,597,228, Cl. 51-235.000.

Koziol, Jeffrey; Nowacki, Christopher; and Brisson, Alfred G., to Trutek Research, Inc. Apparatus for removing cataracts. 4,597,388, Cl. 128-303.100.

Kraft, Inc.: *See*—
Davis, Loren L., 4,597,971, Cl. 426-36.000.

Kramer-Werke GmbH: *See*—
Friedrich, Karl, 4,597,468, Cl. 180-255.000.

Kraushaar, Robert J.; and Ward, Kevin B., to International Telephone and Telegraph Corporation. Solar blind ultraviolet filter. 4,597,629, Cl. 350-1.500.

Kreeger, Elsmer W., to Pinckney Molded Plastics, Inc. Pallet. 4,597,338, Cl. 108-51.100.

Kren, George J.: *See*—
Wheeler, William R.; Kudinar, Rusmin; Kren, George J.; and Clementson, David D., 4,597,708, Cl. 414-331.000.

Kricka, Larry J.; Thorpe, Gary H. G. H.; and Whitehead, Thomas P., to National Research Development Corporation. Enhanced luminescent or luminometric assay. 4,598,044, Cl. 435-28.000.

Krieger, Karl; Hartleb, Jochem; and Reinelt, Werner, to Hermann Hemscheidt Maschinenfabrik GmbH & Co. Hydraulically-controlled non-return valve. 4,597,557, Cl. 251-63.400.

Kropf, Walter K., to Smucker, Lee A. Vacuum/gravity feed contact herbicide applicator. 4,597,219, Cl. 47-1.500.

Krumreich, Charles L., to AT&T Bell Laboratories. Connector assembly. 4,597,623, Cl. 339-97.00P.

Krupp Polysius AG: *See*—
Heinemann, Otto; Baldus, Heinz-Dieter; Supp, Armin; Nanz, Hans; Thieme, Helmut; and Rasch, Heinz, 4,597,867, Cl. 210-218.000.
Kukuck, Karl-Heinz; and Baran, Werner, 4,597,860, Cl. 209-223.00A.

Krupp, Stephen P.: *See*—
Dallessandro, Susan M.; Archer, Wesley L.; and Krupp, Stephen P., 4,597,890, Cl. 252-153.000.

Kruse, Robert L.: *See*—
Aliberti, Vincent A.; Kruse, Robert L.; and Valcarce, Eduardo M., 4,598,124, Cl. 525-86.000.

Krutchen, Charles M.; and Wu, Wen-Pao, to Mobil Oil Corporation. Polymer foam, thermoformed shapes thereof and methods of forming same. 4,598,098, Cl. 521-59.000.

Krutchen, Charles M.; and Wu, Wen-Pao, to Mobil Oil Corporation. Polymer foam, thermoformed shapes thereof and methods of forming same. 4,598,100, Cl. 521-81.000.

Krutchen, Charles M.; and Wu, Wen-Pao, to Mobil Oil Corporation. Polymer foam, thermoformed shapes thereof and methods of forming same. 4,598,101, Cl. 521-81.000.

Krutchen, Charles M.; and Wu, Wen-Pao, to Mobil Oil Company. Polymer foam, thermoformed shapes thereof and method of forming same. 4,598,104, Cl. 521-139.000.

Kuchar, Paul J.; Sampson, Robert W.; and Pacanowski, Ronald F., to UOP Inc. Humidity monitor and method. 4,597,285, Cl. 73-29.000.

Kuchera, Ray A.: *See*—
Ramser, Robert A.; Barch, Daniel R.; Buchovecky, Kalman E.; and Kuchera, Ray A., 4,597,919, Cl. 264-12.000.

Kudinar, Rusmin: *See*—
Wheeler, William R.; Kudinar, Rusmin; Kren, George J.; and Clementson, David D., 4,597,708, Cl. 414-331.000.

Kuenzel, Ulrich: *See*—
Bayer, Thomas; Hinkel, Holger; Kleischmann, Kurt; Kuenzel, Ulrich; and Schafer, Rolf, 4,598,017, Cl. 428-336.000.

Kuhlthau, Hans-Peter; and Harnisch, Horst, to Bayer Aktiengesellschaft. Cationic dyestuffs, a process for their preparation, and their use for dyeing and mass-coloring. 4,598,151, Cl. 546-167.000.

Kuhne, Reinhart; and Kuisl, Max, to Licentia Patent-Verwaltungs-GmbH. Method for producing a directed aerosol stream. 4,597,983, Cl. 427-27.000.

Kuiper, Gerald J.: *See*—
Gardner, Jeffrey B.; Kuiper, Gerald J.; and Nelson, Richard A., 4,598,183, Cl. 200-50.00A.

Kuisl, Max: *See*—
Kuhne, Reinhart; and Kuisl, Max, 4,597,983, Cl. 427-27.000.

Kukanskis, Peter E.; and Rhodenizer, Harold L., to MacDermid, Incorporated. Process for preparing printed circuit board thru-holes. 4,597,988, Cl. 427-97.000.

Kukuck, Karl-Heinz; and Baran, Werner, to Krupp Polysius AG. Coil arrangement for a magnetic separator having a strong field. 4,597,860, Cl. 209-223.00A.

Kulawick, Gabriele: *See*—
Bottcher, Regina; Juhnke, Hubert; Kulawick, Gabriele; Zehle, Gunter; and Zosche, Helmut, 4,597,980, Cl. 426-568.000.

Kultaranta Tapani, to Oy Wartsila Ab. Roller press. 4,597,326, Cl. 100-50.000.

Kummer, Emanuel: *See*—
Oetiker, Hans; and Kummer, Emanuel, 4,597,405, Cl. 137-14.000.

Kumura, Haruyoshi: *See*—
Tanaka, Yoshikazu; Yamamuro, Sigeaki; Abo, Keiju; Kumura, Haruyoshi; Hirano, Hiroyuki; and Morimoto, Yoshiro, 4,597,308, Cl. 74-866.000.

Kuniyoshi, Shinji: *See*—
Terasawa, Tsuneo; Kuniyoshi, Shinji; Takanashi, Akihiro; Kurosaki, Toshiei; Kawamura, Yoshio; and Hosaka, Sumio, 4,597,669, Cl. 356-401.000.

Kuntz, Bernard: *See*—
Legallais, Lucien; and Kuntz, Bernard, 4,597,276, Cl. 72-49.000.

Kunugita, Kiyohiko: *See*—
Takagi, Hirofumi; Kunugita, Kiyohiko; Sawai, Hideki; and Kariyone, Kazuo, 4,598,066, Cl. 514-18.000.

Kupfer, Ernst: *See*—
Hadvary, Paul; Hochuli, Erich; Kupfer, Ernst; Lengsfeld, Hans; and Weibel, Ernst K., 4,598,089, Cl. 514-449.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Okada, Yoshio; and Igarashi, Yuriko, 4,597,993, Cl. 427-150.000.

Kurihara, Norigi; and Sakuda, Ryutaro, to Aubex Corporation. Method of manufacturing synthetic resin pen nibs. 4,597,932, Cl. 264-145.000.

Kurkov, Victor P.: *See*—
Denisevich, Peter, Jr.; Schroeder, Albert H.; Kurkov, Victor P.; and Suzuki, Shigeto, 4,597,896, Cl. 252-500.000.

Kuroda, Tsuyoshi: *See*—
Tahara, Tetsuya; Arita, Masafumi; and Kuroda, Tsuyoshi, 4,598,093, Cl. 514-538.000.

Kurosaki, Toshiei: *See*—
Terasawa, Tsuneo; Kuniyoshi, Shinji; Takanashi, Akihiro; Kurosaki, Toshiei; Kawamura, Yoshio; and Hosaka, Sumio, 4,597,669, Cl. 356-401.000.

Kurtz, John A.; Cousens, Donald E.; and Dufour, Mark D., to Fairchild Camera & Instrument Corporation. Lead wire bonding with increased bonding surface area. 4,597,519, Cl. 228-102.000.

Kurumi, Masateru: *See*—
Fujii, Setsuro; Sato, Takuo; Kawamura, Hiroyuki; Yaegashi, Takashi; Kurumi, Masateru; and Aoyama, Takuo, 4,598,077, Cl. 514-233.000.

Kusuhara, Rei; Otsubo, Koichi; and Yatabe, Yasuo, to Tomco Mfg., Ltd. Apparatus for altering pitch in arrangement of wafers. 4,597,819, Cl. 156-345.000.

Kutowy, Oleh: *See*—
Guiver, Michael D.; Kutowy, Oleh; and Apsimon, John W., 4,598,137, Cl. 528-173.000.

Kyocera Corporation: *See*—
Hobo, Sumiya; Shimizu, Toshio; and Nishida, Masaru, 4,597,431, Cl. 164-253.000.
Nakamura, Noboru, 4,597,685, Cl. 401-199.000.
Swidler, Ron; and Ploeger, Dale, 4,598,302, Cl. 346-76.0PH.

Kyogoku, Hideaki; and Tamura, Fujio, to Seiko Instruments & Electronics Ltd. Barometer. 4,597,288, Cl. 73-384.000.

Kyowa Works Co., Ltd.: *See*—
Takiguchi, Hiroshi; Sugiyama, Yoshikatu; and Hosoya, Ryoji, 4,597,484, Cl. 192-70.150.

L. & C. Steinmuller GmbH: *See*—
Schuster, Ernst; and Knizia, Klaus, 4,597,257, Cl. 60-39.120.

Labuc, Vladimir M.: *See*—
Rosenblum, Frank; and Labuc, Vladimir M., 4,597,507, Cl. 222-16.000.

Lachonius, Leif; and Ullberg, Carl, to Aktiebolaget SKF. Conveyor chain. 4,597,492, Cl. 198-852.000.

Lackey, Walter J.: *See*—
Stinton, David P.; Lackey, Walter J.; and Lauf, Robert J., 4,598,024, Cl. 428-448.000.

Ladeur, Peter: *See*—
Goudriaan, Frans; Hake, Timothy S.; Ladeur, Peter; Moureaux, Patrique; Saint, Jean-Paul; and van Dijk, Nicolaas, 4,598,059, Cl. 502-228.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Loiseau, Gerard; Molozay, Maurice; and Rigo, Michel, 4,597,406, Cl. 137-113.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation Procedes Georges Claude: *See*—
Marhic, Gerard; and Remy, Francis, 4,598,191, Cl. 219-121.0PW.

Laitram Corporation, The: *See*—
Lapeyre, James M., 4,597,747, Cl. 474-227.000.

Lal, Bansi; Dornauer, Horst; Bhattacharya, Bani K.; Dohadwalla, Alihussein N.; and de Souza, Noel J., to Hoechst Aktiengesellschaft. Pyrimido(6-1-a)isoquinolin-4-one derivatives. 4,598,148, Cl. 544-252.000.

Lamanna, Anthony. Golf club assembly system and method. 4,597,577, Cl. 273-80.100.

Lambertus, Friedrich, to Werner & Pfleiderer. Filter device for a screw extruder. 4,597,870, Cl. 210-341.000.

Lancaster, John B., to Eaton Corporation. Golf club grip. 4,597,578, Cl. 273-81.00R.

Langel, Rolf: *See*—
Thoma, Wilhelm; Langel, Rolf; and Schroer, Walter, 4,598,120, Cl. 524-591.000.

Langlois, Michel: *See*—
Strolin-Benedetti, Margherita; Guerret, Patrick G.; Langlois, Michel; and Dostert, Philippe L., 4,598,084, Cl. 514-374.000.

Lapeyre, James M., to Laitram Corporation, The. Detachable link chain. 4,597,747, Cl. 474-227.000.

Larin, Leo H. Method of making badges or emblems. 4,597,146, Cl. 29-160.600.

Larsen, Ebbe D., to Aktieselskabet Jens Villadsens Fabriker. Process for the preparation of a water-impervious surface coating. 4,597,817, Cl. 156-280.000.

Laser Industries Ltd.: *See*—
Raif, Joshua; and Zair, Eliezer, 4,597,380, Cl. 128-6.000.

Lassig, Martin; and Bey, Ulf, to Anschutz & Co. GmbH. Universally movable suspension member. 4,597,475, Cl. 188-378.000.

Lates, Kornel, to Scepter Manufacturing Co. Ltd. Unitary molded citrus crate. 4,597,503, Cl. 220-83.000.

Lau, Hon C.: *See*—
Dilgren, Richard E.; Lau, Hon C.; and Hirasaki, George J., 4,597,442, Cl. 166-272.000.

Lau, Po C. Large capacity paper clip. 4,597,139, Cl. 24-546.000.

Lauf, Robert J.: *See*—
Stinton, David P.; Lackey, Walter J.; and Lauf, Robert J., 4,598,024, Cl. 428-448.000.

Lauffer, Donald K.; Rostek, Paul M.; and Sani, Mehdi H., to NCR Corporation. Assist circuit for a data bus in a data processing system. 4,598,216, Cl. 307-443.000.

Lavalou, Eric: *See*—
Fabre, Jean; Lavalou, Eric; and Nicolas, Francois, 4,597,952, Cl. 423-122.000.

Lawson, Robert J.: *See*—
Lawson, William J.; and Lawson, Robert J., 4,598,221, Cl. 310-103.000.

Lawson, William J.; and Lawson, Robert J. Permanent magnet motor having rockable rotor magnets. 4,598,221, Cl. 310-103.000.

Lax, Ronald G.; Johnson, Robert G.; Henningsen, Charles G.; and Ellis, J. Scott, to Quintec Interconnect Systems. Shielded connector and method of forming same. 4,597,624, Cl. 339-143.00R.

Leach, Douglas R., to Hercules Incorporated. Method, composition and product produced by delayed gelation in the polymerization of cycloolefins. 4,598,102, Cl. 521-93.000.

Leach, Jerald G., to Texas Instruments Incorporated. Combination of a data processor with a switch means. 4,598,383, Cl. 364-900.000.

Leadvaro, Stephen J.: *See*—
English, George J.; Gagnon, Peter R.; and Leadvaro, Stephen J., 4,598,342, Cl. 362-213.000.

Lee, Robert J. Mandrel for forming an internal enlargement for a gasket or sealing ring in a pipe or tube. 4,597,149, Cl. 29-235.000.

LeFrank, Robert J., to Ruesch Machine Company. Device for simultaneous winding of several tapes on individual reels. 4,597,542, Cl. 242-64.000.

Legallais, Lucien; and Kuntz, Bernard, to Coflexip. Apparatus for making helically wound interlocked tubular structure. 4,597,276, Cl. 72-49.000.

Legatti, Raymond H., to Technology Research Corporation. Ground fault current interrupter circuit with open neutral and ground lead protection. 4,598,331, Cl. 361-46.000.

Legille, Edouard; Mailliet, Pierre; Loutsch, Jeannot; and Welter, Jean-Pierre, to Paul Wurth S.A. Device for introducing dosed quantities of pulverized materials into a carrier gas stream and application thereof to a distribution tank for pulverized materials. 4,597,694, Cl. 406-129.000.

Le Helloco, Michel R.: *See*—
Verdeau, Jean-Jacques; and Le Helloco, Michel R., 4,597,935, Cl. 376-353.000.

Lehner, August: *See*—
Roller, Hermann; Hack, Joachim; Woweries, Uwe; Lehner, August; Grau, Werner; Nagel, Peter; and Falk, Roland, 4,597,990, Cl. 427-130.000.

Leiner, Hans R., to Honeywell Inc. Digital recording apparatus with disparity reducing encoder. 4,598,326, Cl. 360-40.000.

Leloup, Jean: *See*—
Barraud, Andre ; Leloup, Jean; and Ruaudel, Annie, 4,598,056, Cl. 502-4.000.

Lembens, Helmut, to Francotyp-Postalia GmbH. Inking mechanism for franking and price stamping machines. 4,597,329, Cl. 101-363.000.

LeMessurier, David H. Bird frightening devices. 4,597,357, Cl. 116-22.00A.

Leng, Svay; Suganuma, Saburo; and Kataoka, Hiroyuki, to Fuji Xerox Co., Ltd. High speed copying machine. 4,597,660, Cl. 355-3.0SH.

Lengsfeld, Hans: *See*—
Hadvary, Paul; Hochuli, Erich; Kupfer, Ernst; Lengsfeld, Hans; and Weibel, Ernst K., 4,598,089, Cl. 514-449.000.

Lengyel, Albin D. Composition and method for minimizing frost damage to plants. 4,597,883, Cl. 252-70.000.

Leningradsky Tekhnologichesky Institute Tselljulozno-Bumazhnoi Promyshlennosti: *See*—
Terentiev, Otto A.; Burov, Anatoly V.; Vorobieva, Ekaterina Y.; Grudinka, Ekaterina I.; Nesterchuk, Gennady T.; Shapovalov, Oleg I.; Usmanov, Khamdam U.; Mirkamilov, Shavkat M.; Mirkamilov, Tolkun M.; and Sharkov, Vladimir V., 4,597,928, Cl. 264-87.000.

Lenkei, Andrew. Split leaflet heart valve. 4,597,767, Cl. 623-2.000.

Lenzer, Xaver: *See*—
Blumer, Leo; and Lenzer, Xaver, 4,597,253, Cl. 56-13.400.

Leonard, David P.: *See*—
Wright, Howard J.; Leonard, David P.; and Etzell, Roger A., 4,598,111, Cl. 524-40.000.

Lessor, Ralph A.: *See*—
Rice, Kenner C.; Rafferty, Michael F.; Jacobson, Arthur E.; Contreras, Patricia; O'Donohue, Thomas L.; Lessor, Ralph A.; and Mattson, Mariena V., 4,598,153, Cl. 546-229.000.

Letchford, John A.: *See*—
Halberstadt, Alex L.; and Letchford, John A., 4,598,194, Cl. 219-464.000.

Leu, Willy, to Ferag AG. Apparatus for unwinding printed products wound up in an imbricated formation. 4,597,541, Cl. 242-55.000.

Leuthen, John M., to Hughes Tool Company. Thyristor firing circuit for determining phase angle. 4,598,353, Cl. 363-87.000.

Levan, Robert L. Carving adapter for multi-purpose woodworking machine. 4,597,424, Cl. 144-1.00C.

Lever Brothers Company: *See*—
Goedhart, Machiel; Gortemaker, Franciscus H.; Kemper, Hermanus C.; and Kielman, Hendrik S., 4,597,886, Cl. 252-95.000.
Hendriks, Albertus G.; and Mijnders, Aart, 4,597,242, Cl. 53-426.000.

Levin, Arthur L.: *See*—
Gum, Peter H.; Levin, Arthur L.; Smith, Ronald M.; and Wilson, John H., 4,598,364, Cl. 364-300.000.

Lewis, Alun: *See*—
Byford, Derek C.; Green, Peter J.; and Lewis, Alun, 4,597,893, Cl. 252-354.000.

Licari, Anthony, to AFA Consolidated Corporation. Positive one-way check valve. 4,597,511, Cl. 222-380.000.

Licentia Patent-Verwaltungs-GmbH: *See*—
Kuhne, Reinhart; and Kuisl, Max, 4,597,983, Cl. 427-27.000.

Liebermann, Hanne. Device to facilitate changing tires. 4,597,711, Cl. 414-427.000.

Liebetrau, Richard E. Wall structure for machine enclosures. 4,597,698, Cl. 409-134.000.

Lightmasters, Ltd.: *See*—
Henning, Haden V.; Warthan, Jerry G.; and Fajt, John, 4,598,229, Cl. 313-493.000.

Linde, Gilbert W.; Stauffer, Norman M.; and Brackbill, Warren H., to Sperry Corporation. Material breakup device for manure spreaders. 4,597,532, Cl. 239-675.000.

Linder, Jacques F.: *See*—
Scapple, Robert Y.; Peters, John W.; Linder, Jacques F.; and Yee, Edward M., 4,597,986, Cl. 427-53.100.

Lindner, Melvin; and Mackey, Ronald A., to J. B. Nottingham & Co., Inc. Electrical connector and method of using it. 4,597,620, Cl. 339-89.00R.

Lingemann, Horst, to Helmut Lingemann GmbH & Co. Curved corner of a spacer frame of an insulating glazing, and a process for the production thereof. 4,597,232, Cl. 52-304.000.

Lingwood, Clifford A., to Hospital for Sick Children, The. Method for coupling a hydrocarbon containing molecular species. 4,597,999, Cl. 427-54.100.

Linke, Wilfried: *See*—
Dolata, Hans; Meyle, Werner; Linke, Wilfried; Hagele, Hermann; and Buck, Ernst, 4,597,178, Cl. 30-138.000.

Linville, Kevin D.: *See*—
Ibrahim, Adel A.; Linville, Kevin D.; and Mays, Jerry E., 4,597,389, Cl. 128-328.000.

Lion Corporation: *See*—
Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, 4,597,879, Cl. 252-8.55D.

Lisec, Peter. Apparatus for bending hollow shaped bar portions to form spacer frames for insulating glass. 4,597,279, Cl. 72-306.000.

Littlejohn, Robert J., to Ellenburg, Marvin L.; and Huffman, Samuel L. Trailer caravan. 4,597,585, Cl. 280-411.00C.

Littler, Joseph: *See*—
Seddon, Alan E.; and Littler, Joseph, 4,598,180, Cl. 191-35.000.

Litton Systems, Inc.: *See*—
Curby, Robert D.; and McCammon, George H., 4,597,667, Cl. 356-350.000.

Liu, Nan-I; and McCready, Russell J., to General Electric Company. Elastomeric compositions comprising a combination of (a) an aromatic thermoplastic polyester and (b) clay/syenite. 4,598,117, Cl. 524-444.000.

Lizell, Magnus. Restriction valve device for hydraulic pressure fluids in vehicle shock absorbing mechanisms. 4,597,411, Cl. 137-493.800.

Lloyd, Albert H., Jr.: *See*—
Chea, Ramon C. W., Jr.; Keegan, Kevin C.; Pothuri, Reddeppa N.; and Lloyd, Albert H., Jr., 4,598,173, Cl. 179-18.0FA.

Lobsinger, James L.: *See*—
Aleem, Mohd A.; Lobsinger, James L.; and Wefel, Jerry D., 4,598,218, Cl. 310-42.000.

Loggy, Albert D. Method of constructing a modular reinforced building structure. 4,597,925, Cl. 264-32.000.

Logsdon, Gary L.; Scheevel, Mark R.; and Williams, Frank A., Jr., to Burroughs Corporation. Allocator for a reduction processor evaluating programs stored as binary directed graphs employing variable-free applicative language codes. 4,598,361, Cl. 364-200.000.

Lohn, Klaus B., to U.S. Philips Corporation. Electronic transformer composed of flyback converters. 4,598,349, Cl. 363-8.000.

Loiseau, Gerard; Molozay, Maurice; and Rigo, Michel, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Device for supplying a pipe with a fluid at a particular pressure from alternative sources. 4,597,406, Cl. 137-113.000.

Lok, Cornelis M.; and Ganguli, Keshab L., to Internationale Octrooi Maatschappij "Octropa" B.V. Process for hydrogenating fatty compounds by use of a transition metal/transition metal silicate catalyst. 4,597,908, Cl. 260-409.000.

Lonza Ltd.: *See*—
Egli, Rene ; and Staub, Hans-Rudolf, 4,597,526, Cl. 239-123.000.

L'Oreal: *See*—
Grollier, Jean F.; Dubief, Claude; and Cauwet, Daniele, 4,597,962, Cl. 424-47.000.
Gueret, Jean-Louis H., 4,597,501, Cl. 215-330.000.

Lorenzi, Donald E.; and Wagerer, Helmut F., to Magnaflux Pipeline Services, Inc. Corrosion sensor device including side-by-side bar magnets surrounded by a coil. 4,598,250, Cl. 324-220.000.

Loskorn, Richard A., to Burroughs Corporation. Read control operations system for a multiple line adapter organization. 4,598,360, Cl. 364-200.000.

Louis Pokorny Company, Inc.: *See*—
Pokorny, Louis, Jr.; and Pokorny, L. Robert, 4,597,115, Cl. 5-13.000.

Loutsch, Jeannot: *See*—
Legille, Edouard; Mailliet, Pierre; Loutsch, Jeannot; and Welter, Jean-Pierre, 4,597,694, Cl. 406-129.000.

LTV Aerospace and Defense Co.: *See*—
Smith, James L., 4,598,395, Cl. 369-100.000.

Lubbers, Dietrich W.: *See*—
Opitz, Norbert; and Lubbers, Dietrich W., 4,597,392, Cl. 128-637.000.

Lubrizol Corporation, The: *See*—
Vinči, James N., 4,598,026, Cl. 428-467.000.

Lucas Industries public limited company: *See*—
Smith, Trevor S., 4,597,407, Cl. 137-115.000.

Luccio, Alfredo U.; and Brill, Bertrand A., to Imaging Sciences Associates Limited Partnership. Method and apparatus for producing X-rays. 4,598,415, Cl. 378-119.000.

Lucke, Wolfgang; Beneke, Herbert; and Staglich, Peter, to Rutgerswerke Aktiengesellschaft. Stable, phenolic modified hydrocarbon resins for leucopigments. 4,598,138, Cl. 528-205.000.

Luk Lamellen und Kupplungsbau GmbH: *See*—
Braun, Helmut, 4,597,485, Cl. 192-70.270.

Lundt, Behrend F.; Jorgensen, Karin D.; Johansen, Nils L.; Gronvald, Frederik C.; Frandsen, Erik K.; Moody, Alister J.; and Markussen, Jan, to Novo Industri A/S. Use of peptides as medicaments and certain novel peptides. 4,598,065, Cl. 514-12.000.

Lunsford, Kevin S. Portable medical gas warming system. 4,597,917, Cl. 261-153.000.

Luxtec Corporation: *See*—
VanDerBel, Frans G., 4,597,383, Cl. 128-18.000.

Lyman, John B., to Whirlpool Corporation. Electrical connection means for canister vacuum cleaner. 4,597,130, Cl. 15-327.00R.

Lyman, John B., to Whirlpool Corporation. Mounting for motor-fan unit. 4,597,131, Cl. 15-412.000.

Lynch, Joseph A.; and Ignatuk, Daniel, to Nabisco Brands, Inc. Phase controlled apparatus for a processing operation. 4,597,488, Cl. 198-339.100.

Lynn, Otto F.: *See*—
Brandstetter, Robert W.; Lynn, Otto F.; Reich, Abraham; and Waido, Richard P., 4,597,630, Cl. 350-3.830.

M & D Balloons, Inc.: *See*—
Pharo, Daniel A., 4,597,244, Cl. 53-434.000.

Maas, Michael, to Siemens Aktiengesellschaft. Electrical line interruption detection and alarm circuit. 4,598,281, Cl. 340-664.000.

MacDermid, Incorporated: *See*—
Kukanskis, Peter E.; and Rhodenizer, Harold L., 4,597,988, Cl. 427-97.000.

Mace, Robert E.: *See*—
Brennecke, James H.; and Mace, Robert E., 4,597,783, Cl. 55-378.000.

Mackey, Ronald A.: *See*—
Lindner, Melvin; and Mackey, Ronald A., 4,597,620, Cl. 339-89.00R.

MacLarty, Bernard G., to Van Leer S.A. (Proprietary) Limited. Combined closure and pouring spout. 4,597,508, Cl. 222-83.000.

Macrander, Albert T.: *See*—
Capasso, Federico; Focht, Marlin W.; Macrander, Albert T.; and Schwartz, Bertram, 4,597,165, Cl. 29-576.00B.

Madaffer, Anthony J., to General Motors Corporation. Camshaft assembly and method. 4,597,365, Cl. 123-90.600.

Maeda, Jun; and Mori, Yoshikatsu, to Sumitomo Electric Industries Ltd. Throwaway insert. 4,597,696, Cl. 407-114.000.

Maeda, Minoru: *See*—
Iwasaki, Masayuki; Maeda, Minoru; Shinozaki, Fumiaki; and Ishige, Sadao, 4,598,036, Cl. 430-270.000.

Maertins, Hans F. W.; Mays, James C.; and Corrigan, Charles E., to Garrett Corporation, The. Mean temperature sensor. 4,597,675, Cl. 374-115.000.

Magara, Syoji: *See*—
Aoyama, Takeo; Magara, Syoji; Yokoyama, Shigeki; Kamei, Tadashi; and Uehara, Mikio, 4,597,818, Cl. 156-308.200.

Magee Plastics Company: *See*—
Magee, Ted N., 4,597,606, Cl. 297-422.000.

Magee, Ted N., to Magee Plastics Company. Arm cap for airplane seat or the like. 4,597,606, Cl. 297-422.000.

Magnaflux Pipeline Services, Inc.: *See*—
Lorenzi, Donald E.; and Wagerer, Helmut F., 4,598,250, Cl. 324-220.000.

MagneTek, Inc.: *See*—
Gaylord, F. David; and Wickersheimer, Jack C., 4,598,219, Cl. 310-87.000.

Maher, Timothy J.: *See*—
Wurtman, Richard J.; and Maher, Timothy J., 4,598,094, Cl. 514-561.000.

Mahlmann, Enno: *See*—
Keggenhoff, Berthold; Mahlmann, Enno; Eifler, Willi; and Ellendt, Gunther, 4,597,909, Cl. 560-347.000.

Mailliet, Pierre: *See*—
Legille, Edouard; Mailliet, Pierre; Loutsch, Jeannot; and Welter, Jean-Pierre, 4,597,694, Cl. 406-129.000.

Mainardi, Riccardo: *See*—
De Angelis, Giancarlo; Saglimbeni, Renato; and Mainardi, Riccardo, 4,598,371, Cl. 364-431.040.

Majima, Shinichi; and Ogawa, Atsushi, to Kabushiki Kaisha Toshiba. Switching regulator. 4,598,244, Cl. 323-351.000.

Majima, Teiji; and Watanabe, Hiromichi, to Fujitsu Limited. Method for forming patterns. 4,597,826, Cl. 156-643.000.

Makino, Kazuo; Matsumoto, Akira; and Kabeya, Hideo, to Ito Optical Industrial Co., Ltd. Organic glass for optical parts. 4,598,133, Cl. 526-322.000.

Makino, Naonori: *See*—
Kawamura, Kouichi; Horie, Seiji; Makino, Naonori; and Sato, Hideo, 4,598,033, Cl. 430-75.000.

Makino, Yuji: *See*—
Nagase, Hidenobu; and Makino, Yuji, 4,597,915, Cl. 261-29.000.

Mako, Frederick M.; Pasour, John A.; and Roberson, Charles W., to United States of America, Navy. Spectrum analyzer and analysis method for measuring power and wavelength of electromagnetic radiation. 4,598,247, Cl. 324-77.00R.

Mallinson, Stephen R., to British Telecommunications. Temperature sensitive releasable optical connector. 4,597,632, Cl. 350-96.210.

Manchem Limited: *See*—
Turner, John H. W., 4,597,800, Cl. 106-264.000.

Mann, Arthur S., to Identrol. Camera with movable film pack and rotatable lens for sequential exposures and photo identification system. 4,597,655, Cl. 354-121.000.

Manning, Donald L., to Transpec, Inc. Energy absorbing vehicle bumper. 4,597,601, Cl. 293-122.000.

Mantarro, Joseph, to Monsanto Company. Spray-suppression device. 4,598,000, Cl. 428-17.000.

Manville Service Corporation: *See*—
Schuster, Richard L., 4,597,523, Cl. 229-40.000.

Marc Industries Incorporated: *See*—
Ross, Clive; and Devoy, Ralph P., 4,598,275, Cl. 340-573.000.

Marek, James R.: *See*—
Burrage, Lawrence M.; Shaw, J. Howard; Marek, James R.; and Anderson, David W., 4,598,265, Cl. 337-219.000.

Marelli, Ernesto. Apparatus for emulsifying and atomizing fluid fuels with secondary fluids, in particular water. 4,597,671, Cl. 366-127.000.

Marhic, Gerard; and Remy, Francis, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation Procedes Georges Claude. Very low power plasma arc cutting equipment. 4,598,191, Cl. 219-121.0PW.

Marin, Guy F. M.; and Hethuin, Serge, to U.S. Philips Corporation. Control device for a synchro receiver. 4,598,289, Cl. 340-870.340.

Marin Tek, Inc.: *See*—
Forrest, Scott M., 4,597,267, Cl. 62-55.500.

Markos, Peter. Lighted plumb bob. 4,597,186, Cl. 33-392.000.

Markussen, Jan: *See*—
Lundt, Behrend F.; Jorgensen, Karin D.; Johansen, Nils L.; Gronvald, Frederik C.; Frandsen, Erik K.; Moody, Alister J.; and Markussen, Jan, 4,598,065, Cl. 514-12.000.

Marley, Robert R.; and Birrittella, Mark S., to Motorola, Inc. Bipolar transient driver. 4,598,213, Cl. 307-270.000.

Maroselli, Jacques: *See*—
Bourrie, Andre R. J.; and Marcselli, Jacques L. R., 4,597,220, Cl. 47-27.000.

Maroselli, Jacques L. R.: *See*—
Bourrie, Andre R. J.; and Maroselli, Jacques L. R., 4,597,220, Cl. 47-27.000.

Marquez, Fidencio G. Window shade sealing system. 4,597,430, Cl. 160-269.000.

Marquez, Joseph A.: *See*—
Waitz, Jay A.; Patel, Mahesh G.; Marquez, Joseph A.; Kalyanpur, Manohar G.; and Horan, Ann C., 4,597,968, Cl. 424-118.000.

Marr, George: *See*—
Chuang, Patrick T.; and Marr, George, 4,598,387, Cl. 365-149.000.

Marrs, C. Denton: *See*—
Seitel, Steven C.; and Marrs, C. Denton, 4,597,639, Cl. 350-363.000.

Mars Limited: *See*—
Eglise, David; and Horton, Edward C., 4,597,506, Cl. 221-6.000.

Marti, Juan P. Headpiece assembly. 4,597,280, Cl. 72-315.000.

Martin, Jean-Marie: *See*—
Selignan, Olivier; Bourgain, Olivier; and Martin, Jean-Marie, 4,597,490, Cl. 198-468.500.

Martin, John L., Jr.: *See*—
Bottom, Carey B.; Gilmore, Jane F.; and Martin, John L., Jr., 4,597,941, Cl. 422-37.000.

Martin, Pierre, to Ciba Geigy Corporation. Process for producing indoles unsubstituted in the 2,3-position and N(3-chloropropionyl)indole produced thereby. 4,598,156, Cl. 548-501.000.

Martinsen, Ove, to OGM Trading ApS. Apparatus for turning tubular garment portions. 4,597,515, Cl. 223-43.000.

Martorana, Piero A.: *See*—
Beyerle, Rudi; Bender, Heinz; Schindler, Ursula; Nitz, Rolf-Eberhard; and Martorana, Piero A., 4,598,079, Cl. 514-252.000.

Marvin Glass & Associates: *See*—
Rehkemper, Steven F.; and Disko, Harry, 4,597,744, Cl. 446-278.000.

Marx, Matthias: *See*—
Horn, Peter; Bunsch, Hellmut; Gehm, Robert; and Marx, Matthias, 4,598,125, Cl. 525-183.000.

Marx, Richard J., II; and Marx, Virginia E. Greenhouse lava rock cooling pad. 4,597,272, Cl. 62-304.000.

Marx, Virginia E.: *See*—
Marx, Richard J., II; and Marx, Virginia E., 4,597,272, Cl. 62-304.000.

Maschinenfabrik Diedesheim GmbH: *See*—
Frank, Hans-Eberhard; and Petrizza, Norbert, 4,597,144, Cl. 29-40.000.

Masover, Gerald K.; and Drysdale, Milton G., to Hana Biologics, Inc. Triphasic mycoplasmatales detection method. 4,598,045, Cl. 435-34.000.

Massachusetts Institute of Technology: *See*—
Jasinski, Thomas J.; and Witt, August F., 4,597,949, Cl. 422-249.000.
Wurtman, Richard J.; and Maher, Timothy J., 4,598,094, Cl. 514-561.000.

Masuyama, Kenichi: *See*—
Miyoshi, Takahito; Masuyama, Kenichi; Okutu, Toshimitu; Utumi, Masahiro; Fujiyama, Masaaki; and Kanazawa, Minoru, 4,598,014, Cl. 428-323.000.

Matson, James A.; Myllymaki, Robert W.; Doyle, Terrence W.; and Bush, James A., to Bristol-Myers Company. Albacarcins V and M. 4,598,145, Cl. 536-1.100.

Matsuda, Akihisa: *See*—
Tanaka, Kazunobu; Matsuda, Akihisa; and Yoshida, Toshihiko, 4,598,304, Cl. 357-4.000.

Matsuda, Kenichi: *See*—
Yoshioka, Susumu; Matsuo, Nobuo; Meguri, Nobuyasu; Murakami, Tadashi; Ishibashi, Yasushi; Matsuda, Kenichi; Suzuka, Teruo; Fukase, Satoshi; and Ohse, Hidetaka, 4,597,856, Cl. 208-112.000.

Matsuda, Koji; Takagi, Toshinori; and Ishikawa, Junzo, to Nissin-High Voltage Co. Ltd. Microwave ion source. 4,598,231, Cl. 315-111.810.

Matsuda, Sakurako: *See*—
Nikaido, Masataka; Kawamoto, Kinji; Murase, Kazuhiro; Kaneaki, Tetsuhiko; Adachi, Tatsuya; and Matsuda, Sakurako, 4,597,318, Cl. 84-1.220.

Matsufuji, Yohji: *See*—
Ohta, Tokuya; Yano, Yasuhiro; Matsufuji, Yohji; Haruta, Masahiro; and Eida, Tsuyoshi, 4,597,794, Cl. 106-20.000.

Matsuhisa, Tsuneyasu: *See*—
Shirai, Hiroshi; and Matsuhisa, Tsuneyasu, 4,597,533, Cl. 239-701.000.

Matsui, Seiji; Yatsunami, Kazuharu; Miyashita, Tsuneo; and Sakamoto, Noboru, to Nippon Kokan Kabushiki Kaisha. Method of producing unbaked agglomerates. 4,597,790, Cl. 75-3.000.

Matsumoto, Akira: *See*—
Makino, Kazuo; Matsumoto, Akira; and Kabeya, Hideo, 4,598,133, Cl. 526-322.000.

Matsumoto, Kuniomi: *See*—
Nishimura, Tamio; Toku, Hiroshige; Yoshii, Shin; Fukuyasu, Harumi; Matsumoto, Kuniomi; Kazuno, Youzo; and Watanabe, Tetsuro, 4,598,095, Cl. 514-632.000.

Matsumoto, Toshio; and Kato, Motokazu, to Fujitsu Limited. System for treatment of single bit error in buffer storage unit. 4,598,402, Cl. 371-38.000.

Matsunaga, Katsuo; Kanbe, Osami; and Otaki, Hiroyuki, to Mitsuba Electric Manufacturing Co., Ltd. Direct current machine. 4,598,222, Cl. 310-198.000.

Matsuo, Katsuharu, to Tokyo Shibaura Denki Kabushiki Kaisha. Safety temperature circuit including zero crossing detector. 4,598,195, Cl. 219-497.000.

Matsuo, Nobuo: *See*—
Yoshioka, Susumu; Matsuo, Nobuo; Meguri, Nobuyasu; Murakami, Tadashi; Ishibashi, Yasushi; Matsuda, Kenichi; Suzuka, Teruo; Fukase, Satoshi; and Ohse, Hidetaka, 4,597,856, Cl. 208-112.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Nikaido, Masataka; Kawamoto, Kinji; Murase, Kazuhiro; Kaneaki, Tetsuhiko; Adachi, Tatsuya; and Matsuda, Sakurako, 4,597,318, Cl. 84-1.220.
Sakamoto, Yoichi, 4,598,319, Cl. 358-195.100.

Matsushita, Takao: *See*—
Hirai, Kazuo; and Matsushita, Takao, 4,598,134, Cl. 528-17.000.

Matsuura, Kiyoshi: *See*—
Oku, Koichi; and Matsuura, Kiyoshi, 4,597,957, Cl. 423-594.000.

Matsuura, Yutaka; Sagawa, Masato; and Fujimura, Setsuo, to Sumitomo Special Metals Co., Ltd. Process for producing permanent magnet materials. 4,597,938, Cl. 419-23.000.

Matsuzaki, Yutaka: *See*—
Yoshitsugu, Noritada; Sugiura, Motonobu; and Matsuzaki, Yutaka, 4,597,587, Cl. 280-807.000.

Mattei, Riccardo; and Gamberini, Antonio, to G. D. Societa Per Azioni. Machine for wrapping and grouping products. 4,597,246, Cl. 53-542.000.

Mattel, Inc.: *See*—
Woolington, John C.; and Chenoweth, James A., 4,597,700, Cl. 409-292.000.

Mattson, Mariena V.: *See*—
Rice, Kenner C.; Rafferty, Michael F.; Jacobson, Arthur E.; Contreras, Patricia; O'Donohue, Thomas L.; Lessor, Ralph A.; and Mattson, Mariena V., 4,598,153, Cl. 546-229.000.

Matz, Klaus; Ritter, Gerhard; Ritter, Klaus; and Pollhammer, Edgar, to AVI Alpenlandische Veredelungs-Industrie Gesellschaft m.b.H. Lining-frame of latticework construction for galleries, tunnels or the like. 4,597,239, Cl. 52-644.000.

Maubray, Daniel L.: *See*—
Eustache, Jean-Pierre H.; and Maubray, Daniel L., 4,597,129, Cl. 15-250.160.

Mauk, Gerhard; Huinink, Heinrich; Seitz, Hans; Frerichs, Udo; Rach, Heinz-Dieter; and Poque , Dionysius, to Continental Gummi-Werke Aktiengesellschaft. Vehicle tire and rim having tire bead rotatable into assembled condition. 4,597,426, Cl. 152-379.500.

Maurer, Thomas; and Devrient, Ludwig. Identification card with duplicate data. 4,597,592, Cl. 283-75.000.

Maurer, Thomas, to GAO Gesellschaft fur Automation und Organisation mbH. Identification card and a method of producing same. 4,597,593, Cl. 283-91.000.

Max Planck Gesellschaft: *See*—
Opitz, Norbert; and Lubbers, Dietrich W., 4,597,392, Cl. 128-637.000.

Maxfield, Howard C.; Phillips, Anthony J.; and Yarwood, Richard J., to Merck Sharp & Dohme. Stabilization of unstable drugs or food supplements. 4,597,969, Cl. 424-157.000.

Maximma Consumer Technologies, Inc.: *See*—
Kerr, William T., 4,597,270, Cl. 62-138.000.

Mayer, Andrew S.: *See*—
Becker, James; and Mayer, Andrew S., 4,597,743, Cl. 446-71.000.

Mayhall, Riley H., Jr.; and Zudal, Andrew. Web feeder apparatus. 4,597,516, Cl. 226-154.000.

Mays, James C.: *See*—
Maertins, Hans F. W.; Mays, James C.; and Corrigan, Charles E., 4,597,675, Cl. 374-115.000.

Mays, Jerry E.: *See*—
Ibrahim, Adel A.; Linville, Kevin D.; and Mays, Jerry E., 4,597,389, Cl. 128-328.000.

McCaffrey, Hugh; Scheibe, Paul; and Spear, Bruce A. Pallet. 4,597,339, Cl. 108-51.100.

McCaghren, Charles P.; and Mullican, Jack A. Boat motor control platform for use with fisherman's chair. 4,597,356, Cl. 114-363.000.

McCall, John M.: *See*—
Szmuszkovicz, Jacob; McCall, John M.; Kaplan, Lester J.; and McMillan, Moses W., 4,598,088, Cl. 514-429.000.

McCammon, George H.: *See*—
Curby, Robert D.; and McCammon, George H., 4,597,667, Cl. 356-350.000.

McCausland, Dominick A. C.; Shirvill, Leslie C.; and Coles, Kenneth F., to Shell Oil Company. Surface-combustion radiant burner. 4,597,734, Cl. 431-328.000.

McCavour, Thomas C.: *See*—
Minialoff, Joseph M.; Minialoff, Gerrard O.; and McCavour, Thomas C., 4,597,229, Cl. 52-1.000.

McConnell, Richard L.: *See*—
Hilbert, Samuel D.; and McConnell, Richard L., 4,598,142, Cl. 528-295.000.

McCready, Russell J.: *See*—
Liu, Nan-I; and McCready, Russell J., 4,598,117, Cl. 524-444.000.

McDonald, Thomas: *See*—
Crane, David O.; McDonald, Thomas; and Horner, Ronald F., 4,597,296, Cl. 73-862.330.

McGarry, Phillip E.: *See*—
Burgess, Lester E.; McGarry, Phillip E.; and Herman, David E., 4,597,858, Cl. 209-166.000.

McGee, James N., Jr., to Burlington Industries, Inc. Seamless product for reinforcing and stabilizing V-belts and methods to produce same. 4,598,013, Cl. 428-290.000.

McGill University: *See*—
Raghavan, Vijaya G. S.; and Pannu, Kulbir, 4,597,737, Cl. 432-197.000.

McGlashen, James N., to Apsley Metals Limited. Apparatus for the manufacture of pneumatic tires. 4,597,728, Cl. 425-23.000.

McGowan, Cynthia B.: *See*—
Rogers, Howard G.; Gaudiana, Russell A.; McGowan, Cynthia B.; Norland, Kenneth S.; and Sahatjian, Ronald J., 4,597,891, Cl. 252-299.100.

McGriff, Donald D. Load leveling device. 4,597,602, Cl. 294-81.300.

McGroarty, Joseph F.; and Houlihan, Thomas D., to Sears, Roebuck, & Co. Hearing aid with self-contained battery compartment and volume control. 4,598,177, Cl. 179-107.00E.

McGuire, Jeffrey C., to Genex Corporation. Phenylalanine ammonia lyase-producing microbial cells. 4,598,047, Cl. 435-108.000.

McKesson Corporation: *See*—
Pereira, LeRoy A., 4,597,509, Cl. 222-129.000.

McKibben, Barry A., to Tektronix, Inc. Digital image correction circuit for cathode ray tube displays. 4,598,234, Cl. 315-370.000.

McLendon, Martin, Jr. Motion interconversion apparatus. 4,597,302, Cl. 74-57.000.

McMillan, Moses W.: *See*—
Szmuszkovicz, Jacob; McCall, John M.; Kaplan, Lester J.; and McMillan, Moses W., 4,598,088, Cl. 514-429.000.

McNabb, Stephen L. Portable production package for oil and gas wells. 4,597,437, Cl. 166-79.000.

McNeal, Norman E.: *See*—
James, Christopher D.; and McNeal, Norman E., 4,598,308, Cl. 357-81.000.

McPherson, James O.: *See*—
Efron, Edward; McPherson, James O.; and Kim, Young B., 4,598,324, Cl. 358-341.000.

McQuary, Charles R.; and Dempsey, Barry J., to Monsanto Company. Method and apparatus for installing highway drainage mat. 4,597,693, Cl. 405-176.000.

McRoberts, Louis A., to Motorola, Inc. Apparatus and method of smoothing MAPS compressed image data. 4,598,372, Cl. 364-518.000.

Mead, Barry B.: *See*—
Piosenka, Gerald V.; and Mead, Barry B., 4,598,170, Cl. 178-22.080.

Mead Corporation, The: *See*—
Johnson, Roy A., 4,597,247, Cl. 53-557.000.

Meathrel, William G., to Graphic Controls Canada Ltd. Device to indicate the concentration of ethylene oxide in the workplace. 4,597,942, Cl. 422-57.000.

Meek, Dale E., to Schlumberger Technology Corporation. Full-bore sample-collecting apparatus. 4,597,439, Cl. 166-163.000.

Mego, Thomas J.: *See*—
Reindel, Kenneth A.; and Mego, Thomas J., 4,598,253, Cl. 330-253.000.

Meguri, Nobuyasu: *See*—
Yoshioka, Susumu; Matsuo, Nobuo; Meguri, Nobuyasu; Murakami, Tadashi; Ishibashi, Yasushi; Matsuda, Kenichi; Suzuka, Teruo; Fukase, Satoshi; and Ohse, Hidetaka, 4,597,856, Cl. 208-112.000.

Mein, Peter G., to Carus Corporation. Process for recovering cesium from cesium ore. 4,597,955, Cl. 423-184.000.

Melamed, Alan M. Solar reflector system. 4,597,377, Cl. 126-438.000.

Melcher, Franz-Josef: *See*—
Knothe, Erich; Melcher, Franz-Josef; and Oldendorf, Christian, 4,597,458, Cl. 177-164.000.

Melnik, Igor M.: *See*—
Efimov, Andrei S.; Melnik, Igor M.; Tkachuk, Jury V.; Tronko, Nikolai D.; Efimova, Elena K.; Obrosova, Irina G.; Gordienko, Vadim M.; Kaminsky, Leonid A.; Staninets, Vasily I.; Zborovsky, Jury L.; Mokhort, Nikolai A.; and Kirichek, Lora M., 4,598,081, Cl. 514-296.000.

Menelly, Richard A. Solar energy storage cell. 4,597,434, Cl. 165-10.000.

Menin, Jacques: *See*—
Bigg, Dennis; and Menin, Jacques, 4,598,086, Cl. 514-402.000.

Merck & Co., Inc.: *See*—
Ponticello, Gerald S., 4,598,149, Cl. 544-319.000.

Merck Sharp & Dohme: *See*—
Maxfield, Howard C.; Phillips, Anthony J.; and Yarwood, Richard J., 4,597,969, Cl. 424-157.000.

Merdler, Myron J.: *See*—
Vedvik, Andrew H.; and Merdler, Myron J., 4,597,704, Cl. 414-28.000.

Merger, Franz; and Schwarz, Wolfgang, to BASF Aktiengesellschaft. Preparation of α-substituted acrylamides. 4,597,907, Cl. 260-404.000.

Merkey, John A.: *See*—
Campbell, Willis R.; and Merkey, John A., 4,597,248, Cl. 56-1.000.

Merry, Jean-Louis, to Charbonnages de France. Self-regulating spray methods and apparatus. 4,597,529, Cl. 239-430.000.

Meshreki, Makram H.: *See*—
Stephen, John F.; Smith, Jerry H.; and Meshreki, Makram H., 4,598,113, Cl. 524-291.000.

Messick, Walker A.: *See*—
O'Brien, Lawrence B.; and Messick, Walker A., 4,597,684, Cl. 401-197.000.

Messina, Elena R.: *See*—
Holmes, John G.; Messina, Elena R.; Resnick, Brian J.; and Teach, Charles C., 4,598,380, Cl. 364-513.000.

Metzinger, Lothar: *See*—
Zeitler, Gerhard; Werner, Frank; Bittner, Gerhard; Baumann, Karl-Heinz; Roeber, Artur; Metzinger, Lothar; Ohlinger, Rainer; and Zettler, Hans D., 4,597,927, Cl. 264-85.000.

Meyle, Werner: *See*—
Dolata, Hans; Meyle, Werner; Linke, Wilfried; Hagele, Hermann; and Buck, Ernst, 4,597,178, Cl. 30-138.000.

Michit, Emile J. Process and machine to mechanically pick up, store and place hollow cone markers used as lane guides. 4,597,706, Cl. 414-30.000.

Micromanipulator Microscope Company, Inc., The: *See*—
Podvin, T. Charles; and Van Benschoten, Peter J., 4,597,643, Cl. 350-507.000.

Middleton, Carlisle A. Convertible snowblower using rectangular shroud interface. 4,597,203, Cl. 37-241.000.

Middleton, William J.: *See*—
Farnham, William B.; Middleton, William J.; and Sogah, Dotsevi Y., 4,598,161, Cl. 564-101.000.

Mignot, Jacques; and Pouyet, Patrice, to Societe d'Optique, Precision Electronique et Mechanique (SOPELEM). Automatic device for the statistical analysis of an object. 4,598,419, Cl. 382-6.000.

Mijnders, Aart: *See*—
Hendriks, Albertus G.; and Mijnders, Aart, 4,597,242, Cl. 53-426.000.

Mikalsen, Jan P.: *See*—
Narvhus, Ingar; and Mikalsen, Jan P., 4,598,352, Cl. 363-69.000.

Mikata, Yuuichi: *See*—
Usami, Toshiro; Mikata, Yuuichi; and Shinada, Kazuyoshi, 4,597,159, Cl. 29-571.000.

Milburn, William W., Jr. Nutation valving apparatus and method of operation. 4,597,403, Cl. 137-1.000.

Miles, Paul S. Self-alternating rear sights for double-barrel firearms. 4,597,211, Cl. 42-1.00S.

Miller, David A. B.: *See*—
Chemla, Daniel S.; Miller, David A. B.; and Smith, Peter W., 4,597,638, Cl. 350-354.000.

Miller, Edward B.; and Eichelberger, Charles W., to General Electric Company. Method and apparatus for controlling distributed electrical loads. 4,598,286, Cl. 340-825.060.

Miller, Kent, to Sundstrand Corporation. Bidirectional brake. 4,597,477, Cl. 192-8.00R.

Miller, Richard S.; Bright, Randall P.; Vargo, Richard D.; and Dreyfuss, Patricia M., to Research One Limited Partnership. Glass fiber reinforced cementitious products. 4,598,012, Cl. 428-228.000.

Miller, William H.: *See*—
Vohr, John H.; Miller, William H.; and Perkins, Jeffrey J., 4,597,676, Cl. 384-114.000.

Milton Industries, Inc.: *See*—
Evenson, Edward, 4,597,716, Cl. 417-181.000.

Mimura, Yoshinori: *See*—
Nakai, Tetsuya; Mimura, Yoshinori; Shinbori, Osamu; and Tokiwa, Hideharu, 4,597,786, Cl. 65-2.000.

Mine Safety Appliances Company: *See*—
Fertig, Glenn H.; and Wozniak, Robert J., 4,598,201, Cl. 250-343.000.

Mineral Deposits Limited: *See*—
Wright, Douglas C., 4,597,861, Cl. 209-459.000.

Minialoff, Gerrard O.: *See*—
Minialoff, Joseph M.; Minialoff, Gerrard O.; and McCavour, Thomas C., 4,597,229, Cl. 52-1.000.

Minialoff, Joseph M.; Minialoff, Gerrard O.; and McCavour, Thomas C., to Minialoff, Joseph M. Pressure relief wall assembly. 4,597,229, Cl. 52-1.000.

Minnesota Mining and Manufacturing Company: *See*—
Heinecke, Steven B., 4,598,004, Cl. 428-40.000.
Nelson, Norman E., 4,598,329, Cl. 360-130.210.
Ollis, Frederick R.; and Tengler, John N., 4,597,156, Cl. 29-564.400.
Tait, William C., 4,598,276, Cl. 340-572.000.
Thill, Gary A.; and Strand, Jerome E., 4,597,754, Cl. 604-154.000.

Minolta Camera Kabushiki Kaisha: *See*—
Hirata, Sumiaki; Ito, Masazumi; and Shibazaki, Kenji, 4,597,662, Cl. 355-14.00R.

Mirkamilov, Shavkat M.: *See*—
Terentiev, Otto A.; Burov, Anatoly V.; Vorobieva, Ekaterina Y.; Grudinka, Ekaterina I.; Nesterchuk, Gennady T.; Shapovalov, Oleg I.; Usmanov, Khamdam U.; Mirkamilov, Shavkat M.; Mirkamilov, Tolkun M.; and Sharkov, Vladimir V., 4,597,928, Cl. 264-87.000.

Mirkamilov, Tolkun M.: *See*—
Terentiev, Otto A.; Burov, Anatoly V.; Vorobieva, Ekaterina Y.; Grudinka, Ekaterina I.; Nesterchuk, Gennady T.; Shapovalov, Oleg I.; Usmanov, Khamdam U.; Mirkamilov, Shavkat M.; Mirkamilov, Tolkun M.; and Sharkov, Vladimir V., 4,597,928, Cl. 264-87.000.

Mis, Frank J. Combined bed frame and box spring assembly. 4,597,118, Cl. 5-246.000.

Misaka, Takaaki; Furukawa, Takeshi; Onuma, Eiichi; Obana, Hiroshi; Fukuyama, Kyosuke; Tanaka, Toshiyuki; Murata, Hiroyuki; and Shimojima, Katuhiko, to Onoda Cement Company, Ltd.; and Kohe Steel, Ltd. Vertical mill. 4,597,537, Cl. 241-79.100.

Miszczak, Frank L.: *See*—
Inciong, Josefino T.; and Miszczak, Frank L., 4,597,583, Cl. 277-235.00B.

Mitchell, Keith J.; Barber, Norman R.; and Ward, Michael, to GEC Mechanical Handling Limited. Latching means. 4,597,689, Cl. 403-322.000.

Mitsuba Electric Manufacturing Co., Ltd.: *See*—
Matsunaga, Katsuo; Kanbe, Osami; and Otaki, Hiroyuki, 4,598,222, Cl. 310-198.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Hayashi, Eikichi, 4,598,407, Cl. 372-87.000.
Morishita, Mitsuharu; and Kouge, Shinichi, 4,598,373, Cl. 364-424.000.
Takagi, Kiyoshi; Toda, Ichiro; Hamasaki, Yoshiharu; and Wakamiya, Yoshinori, 4,598,377, Cl. 364-472.000.

Mitsubishi Monsanto Chemical Co.: *See*—
Ikuma, Sadao; Aoki, Yuji; and Watanabe, Noboru, 4,598,126, Cl. 525-194.000.

Mitsubishi Oil Co., Ltd.: *See*—
Moriya, Kunihiko; Tate, Kazuhito; Muroga, Goro; and Yanagida, Kazuhiro, 4,597,853, Cl. 208-22.000.

Mitsubishi Petrochemical Co., Ltd.: *See*—
Ayusawa, Tadashi; Mori, Shoichiro; Aoki, Tadamichi; and Hamana, Ryozo, 4,598,159, Cl. 549-492.000.

Mitsui High-Tec, Inc.: *See*—
Oboshi, Takamitsu; Koga, Tomoaki; and Imoto, Eiji, 4,597,168, Cl. 29-596.000.

Mitsui Mining & Smelting Co., Ltd.: *See*—
Takagi, Nobuo; Konno, Masakazu; and Kobayashi, Takeo, 4,597,958, Cl. 423-633.000.

Mitutoyo Mfg. Co., Ltd.: *See*—
Nakaya, Tadao, 4,597,303, Cl. 74-89.150.

Miyadera, Yasuo: *See*—
Fujioka, Atsushi; Miyadera, Yasuo; and Fukuda, Tomio, 4,598,115, Cl. 524-376.000.

Miyagi, Masahiro: *See*—
Kitayama, Yukio; Ochiai, Izumi; Nozawa, Yoshio; Miyagi, Masahiro; Ayabe, Tadaaki; and Uehara, Katsuharu, 4,597,171, Cl. 29-727.000.

Miyahara, Michito: *See*—
Wada, Toshiaki; Furukawa, Mitsuhiko; Nagano, Mitsuyoshi; Miyahara, Michito; and Mori, Shigeki, 4,598,052, Cl. 501-87.000.

Miyahira, Hitoshi: *See*—
Hirokawa, Haruo; and Miyahira, Hitoshi, 4,597,158, Cl. 29-566.300.

Miyake, Takashi: *See*—
Iwata, Yoshiki; Kawase, Nobuo; Tanaka, Yoshinori; Miyake, Takashi; and Kawaura, Hiroshi, 4,597,459, Cl. 177-210.00R.

Miyake, Yasuo: *See*—
Ohwaki, Takayuki; Sakashita, Shigeru; Kawahara, Masahiro; Shinoda, Aishin; and Miyake, Yasuo, 4,598,070, Cl. 514-58.000.

Miyasato, Tatsuro: *See*—
Hiraki, Akio; Miyasato, Tatsuro; and Hayashi, Masao, 4,597,844, Cl. 204-192.00C.

Miyashita, Tsuneo: *See*—
Matsui, Seiji; Yatsunami, Kazuharu; Miyashita, Tsuneo; and Sakamoto, Noboru, 4,597,790, Cl. 75-3.000.

Miyata, Toshiya: *See*—
Komatsubara, Michimasa; Fukami, Takeshi; Sakamoto, Akira; Sugita, Takehiro; and Miyata, Toshiya, 4,598,169, Cl. 178-22.040.

Miyata, Yoshiaki: *See*—
Takagi, Kazunori; Soma, Hiroshi; Miyata, Yoshiaki; Motozawa, Yasuki; and Katou, Hitoshi, 4,597,470, Cl. 181-141.000.

Miyauchi, Hirotsugu: *See*—
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,597,913, Cl. 558-436.000.

Miyoshi, Takahito; Masuyama, Kenichi; Okutu, Toshimitu; Utumi, Masahiro; Fujiyama, Masaaki; and Kanazawa, Minoru, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,598,014, Cl. 428-323.000.

Mizuhara, Howard, to GTE Products Corporation. Ductile composite interlayer for joining by brazing. 4,598,025, Cl. 428-450.000.

Mobil Oil Company: *See*—
Krutchen, Charles M.; and Wu, Wen-Pao, 4,598,104, Cl. 521-139.000.

Mobil Oil Corporation: *See*—
Benoit, Gordon, 4,597,494, Cl. 206-390.000.
Boyd, Dana M.; Catchman, Vernon C.; and Broderick, Kevin, 4,597,750, Cl. 493-346.000.
Collins, Jerry C.; Warner, Charles P.; Henkener, Jerry A.; and Glauser, Rolf, 4,598,290, Cl. 340-850.000.
Krutchen, Charles M.; and Wu, Wen-Pao, 4,598,098, Cl. 521-59.000.
Krutchen, Charles M.; and Wu, Wen-Pao, 4,598,100, Cl. 521-81.000.
Krutchen, Charles M.; and Wu, Wen-Pao, 4,598,101, Cl. 521-81.000.
O'Brien, Dennis; and Smith, Graham, 4,597,749, Cl. 493-226.000.
Pann, Keh, 4,598,392, Cl. 367-32.000.
Penick, Joe E., 4,597,854, Cl. 208-58.000.

Mobile Oil Corporation: *See*—
Shu, Winston R.; and Hartman, Kathy J., 4,597,443, Cl. 166-272.000.

Mochida, Shigeru; Yamada, Shunichi; and Hamanaka, Toshiyuki, to NGK Insulators, Ltd. Ceramic material for a honeycomb structure. 4,598,054, Cl. 501-112.000.

Mock, Gerald L.: *See*—
Hanscom, Bradford E.; and Mock, Gerald L., 4,598,171, Cl. 179-6.140.

Modi, Ashok L.: *See*—
Hill, Jeffrey A.; Yohn, Robert L.; Modi, Ashok L.; and Newton, Kevin H., 4,597,330, Cl. 101-93.010.

Moeller, Dennis L.: *See*—
Dean, Mark E.; and Moeller, Dennis L., 4,598,356, Cl. 364-200.000.

Moffat, William, to Yield Engineering Systems, Inc. Method and apparatus for heating semiconductor wafers. 4,597,736, Cl. 432-26.000.

Mohan Rao, G. R., to Texas Instruments Incorporated. Making guard ring for reducing pattern sensitivity in MOS/LSI dynamic RAM. 4,597,805, Cl. 148-1.500.

Mohr, Gregory J., to Truline C.N.C., Inc. Two-stage fluid pump. 4,597,717, Cl. 417-265.000.

Mokhort, Nikolai A.: *See*—
Efimov, Andrei S.; Melnik, Igor M.; Tkachuk, Jury V.; Tronko, Nikolai D.; Efimova, Elena K.; Obrosova, Irina G.; Gordienko, Vadim M.; Kaminsky, Leonid A.; Staninets, Vasily I.; Zborovsky, Jury L.; Mokhort, Nikolai A.; and Kirichek, Lora M., 4,598,081, Cl. 514-296.000.

Molozay, Maurice: *See*—
Loiseau, Gerard; Molozay, Maurice; and Rigo, Michel, 4,597,406, Cl. 137-113.000.

Momose, Akira. Powderfree surgical gloves. 4,597,108, Cl. 2-168.000.

Momose, Masanori: *See*—
Suzaki, Masayuki; Nishiwaki, Shoji; Hayashima, Toshitaka; Araki, Shigeyuki; and Momose, Masanori, 4,598,301, Cl. 346-76.0PH.

Monarch Marking Systems, Inc.: *See*—
Hamisch, Paul H., Jr., 4,597,152, Cl. 29-433.000.
Hamisch, Paul H., Jr., 4,597,331, Cl. 101-110.000.

Monsanto Company: *See*—
Aliberti, Vincent A.; Kruse, Robert L.; and Valcarce, Eduardo M., 4,598,124, Cl. 525-86.000.
Forster, Denis; Schaefer, George F.; and Barker, George E., 4,598,162, Cl. 568-448.000.
Graham, Tommy E., 4,597,777, Cl. 55-16.000.
Mantarro, Joseph, 4,598,000, Cl. 428-17.000.
McQuary, Charles R.; and Dempsey, Barry J., 4,597,693, Cl. 405-176.000.

Moody, Alister J.: *See*—
Lundt, Behrend F.; Jorgensen, Karin D.; Johansen, Nils L.; Gronvald, Frederik C.; Frandsen, Erik K.; Moody, Alister J.; and Markussen, Jan, 4,598,065, Cl. 514-12.000.

Moog Automotive, Inc.: *See*—
Fister, Louis P.; Fitch, Lawrence H.; and Pearson, Herby O., 4,597,150, Cl. 29-407.000.

Moog Inc.: *See*—
Garnjost, Kenneth D.; and Flavell, David J., 4,597,322, Cl. 92-60.000.

Moore, Harry O., to Combis, Chris, a part interest. Universal centrifugal switch assembly. 4,598,185, Cl. 200-80.00R.

Moore, James E., to General Electric Company. Weatherable abrasion resistant etherified aminoplast derived coating for plastic substrates. 4,598,021, Cl. 428-412.000.

Moore, James H. Process for treating edible nuts and seeds. 4,597,973, Cl. 426-93.000.

Moore, M. Samuel; and Paluka, Charles F., to Semco Instruments, Inc. Pressure responsive engine control system. 4,597,259, Cl. 60-39.091.

Moore, Peter E.; and Davies, David H. J., to Graviner Limited. Fire and explosion detection and suppression. 4,597,451, Cl. 169-61.000.

Moorman, Maurice D. Vehicle safety platform for pets. 4,597,359, Cl. 119-1.000.

Mordau, Manfred; Burk, Gerhard; and Stolz, Albert, to Daimler-Benz Aktiengesellschaft. Vehicle air conditioning installation. 4,597,323, Cl. 98-2.110.

Morgan, Russell H.: *See*—
Wang, Shih-Ping; Morgan, Russell H.; and Specht, Donald F., 4,598,369, Cl. 364-414.000.

Mori, Shigeki: *See*—
Wada, Toshiaki; Furukawa, Mitsuhiko; Nagano, Mitsuyoshi; Miyahara, Michito; and Mori, Shigeki, 4,598,052, Cl. 501-87.000.
Mori, Shinji; and Tamura, Keiichi, to Kabushiki Kaisha Toka-Rika-Denki-Seisakusho. Locking mechanism adapted for use in webbing retractor. 4,597,543, Cl. 242-107.40B.

Mori, Shoichiro: *See*—
Ayusawa, Tadashi; Mori, Shoichiro; Aoki, Tadamichi; and Hamana, Ryozo, 4,598,159, Cl. 549-492.000.

Mori, Yoshikatsu: *See*—
Maeda, Jun; and Mori, Yoshikatsu, 4,597,696, Cl. 407-114.000.

Morimoto, Saichi: *See*—
Kamata, Masami; Tabushi, Iwao; Morimoto, Saichi; Asaeda, Takashi; and Aoki, Yoshikazu, 4,597,798, Cl. 106-203.000.

Morimoto, Yoshiro: *See*—
Tanaka, Yoshikazu; Yamamuro, Sigeaki; Abo, Keiju; Kumura, Haruyoshi; Hirano, Hiroyuki; and Morimoto, Yoshiro, 4,597,308, Cl. 74-866.000.

Morinaga & Co., Ltd.: *See*—
Sugiyama, Kenkichi; Saito, Muneo; and Wada, Akio, 4,597,943, Cl. 422-70.000.

Moring, Wilhelm: *See*—
Brand, Gerd; and Moring, Wilhelm, 4,598,310, Cl. 358-19.000.

Morishita, Mitsuharu; and Kouge, Shinichi, to Mitsubishi Denki Kabushiki Kaisha. Charge control microcomputer device for vehicle. 4,598,373, Cl. 364-424.000.

Morishita, Teru: *See*—
Hagiwara, Yoshiyuki; and Morishita, Teru, 4,597,677, Cl. 384-105.000.

Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, to Lion Corporation. Micellar slug for oil recovery. 4,597,879, Cl. 252-8.55D.

Morita, Koyo; Nomura, Keizo; Nishizuka, Hiroshi; Hoshi, Tai; Tamiya, Yoichiro; and Asakawa, Terushige, to Hitachi, Ltd.; and Hitachi Ome Electronic Co., Ltd. Projection aligner. 4,598,197, Cl. 250-205.000.

Moriya, Kunihiko; Tate, Kazuhito; Muroga, Goro; and Yanagida, Kazuhiro, to Mitsubishi Oil Co., Ltd. Pitch as a raw material for making carbon fibers and process for producing the same. 4,597,853, Cl. 208-22.000.

Moriya, Takahiko; and Nakada, Saburo, to Kabushiki Kaisha Toshiba. Method of forming a metal film on a selectively diffused layer. 4,597,167, Cl. 29-590.000.

Morrill, Daniel J.: *See*—
Balsley, Rollin B.; and Morrill, Daniel J., 4,597,260, Cl. 60-39.827.

Morris, Lawrence J., Jr. Collapsible shelter. 4,597,402, Cl. 135-102.000.

Morrison, Barry L.; and Tolson, James W., to Thomson Components - Mostek Corporation. Robot gripper for integrated circuit leadframes. 4,597,714, Cl. 414-729.000.

Moss, John. Still. 4,597,835, Cl. 203-89.000.

Mostafa, Yehra A. High solids oil free polyester industrial protective coating. 4,597,998, Cl. 427-387.000.

Mostmans, Joseph A.: *See*—
Heeres, Jan; Backx, Leo J. J.; and Mostmans, Joseph A., 4,598,085, Cl. 514-383.000.

Motomiya, Takehiko, to Ohkura Electric Co., Ltd. Connectible instrument casing. 4,597,291, Cl. 73-432.0AD.

Motorola, Inc.: *See*—
Marley, Robert R.; and Birrittella, Mark S., 4,598,213, Cl. 307-270.000.
McRoberts, Louis A., 4,598,372, Cl. 364-518.000.
Piosenka, Gerald V.; and Mead, Barry B., 4,598,170, Cl. 178-22.080.
Schechtman, Melvin A.; and Cieslak, Ronald H., 4,598,215, Cl. 307-355.000.

MOTOTRANS narodny podnik: *See*—
Albrecht, Jiri; and Mrstina, Vaclav, 4,597,784, Cl. 55-378.000.

Motozawa, Yasuki: *See*—
Takagi, Kazunori; Soma, Hiroshi; Miyata, Yoshiaki; Motozawa, Yasuki; and Katou, Hitoshi, 4,597,470, Cl. 181-141.000.

Mott, George E., to Texaco Inc. Mooring system and liquid cargo transfer facility for ice infested waters. 4,597,350, Cl. 114-230.000.

Moureaux, Patrique: *See*—
Goudriaan, Frans; Hake, Timothy S.; Ladeur, Peter; Moureaux, Patrique; Saint, Jean-Paul; and van Dijk, Nicolaas, 4,598,059, Cl. 502-228.000.

Mozley, Robert M.; and Wilson, Bryce H., to Continental Disc Corporation. Rupture disc with selectively positioned initial buckling. 4,597,505, Cl. 220-89.00A.

Mrstina, Vaclav: *See*—
Albrecht, Jiri; and Mrstina, Vaclav, 4,597,784, Cl. 55-378.000.

MTS Systems Corporation: *See*—
Harvey, Dennis N., 4,598,420, Cl. 382-8.000.

MTU Motoren-und Turbinen-Union Muenchen GmbH: *See*—
Thoma, Martin; and Bunger, Paul, 4,598,016, Cl. 428-328.000.

Much, Gunter: *See*—
Wittersheim, Adam; and Much, Gunter, 4,597,683, Cl. 401-4.000.

Muir, Francis, to Chevron Research Company. Seismic exploration using non-impulsive vibratory sources activated by stationary, Gaussian codes, detecting vibrations via receivers within a wellbore and processing the results into distortion-free final records. 4,598,391, Cl. 367-25.000.

Mukai, Yasuteru: *See*—
Okouchi, Isao; Izumi, Kenkichi; Takahashi, Sankichi; Mukai, Yasuteru; and Tomida, Akira, 4,597,871, Cl. 210-456.000.

Mulhollan, James S.; and Starr, Lionel. Surgical needle manipulator. 4,597,390, Cl. 128-340.000.

Muller, Gerhard; Hahn, Hans; and Tropschuh, Walter, to Siemens Aktiengesellschaft. Paper stacker for a pre-folded continuous web with a variable-length guide channel. 4,597,752, Cl. 493-410.000.

Muller, Hans: *See*—
Freiberg, Klaus; and Muller, Hans, 4,597,645, Cl. 350-526.000.

Muller, Heinrich, to SKF GmbH. Flocked fiber seal for rolling bearings. 4,597,582, Cl. 277-53.000.

Muller, Helmut; and Brosius, Klaus, to J. M. Voith GmbH. Hydrodynamic control coupling. 4,597,481, Cl. 192-58.00A.

Mullican, Jack A.: *See*—
McCaghren, Charles P.; and Mullican, Jack A., 4,597,356, Cl. 114-363.000.

Munro, Alick R. Portable edge bander for hand held and table mounted operation. 4,597,821, Cl. 156-500.000.

Murai, Toshiharu: *See*—
Koike, Takahisa; Fukazawa, Takao; Ishima, Kazumi; Murai, Toshiharu; Itoh, Tadashi; Kato, Toshifumi; and Jinnai, Koichiro, 4,598,299, Cl. 346-75.000.

Murakami, Tadashi: *See*—
Yoshioka, Susumu; Matsuo, Nobuo; Meguri, Nobuyasu; Murakami, Tadashi; Ishibashi, Yasushi; Matsuda, Kenichi; Suzuka, Teruo; Fukase, Satoshi; and Ohse, Hidetaka, 4,597,856, Cl. 208-112.000.

Murase, Kazuhiro: *See*—
Nikaido, Masataka; Kawamoto, Kinji; Murase, Kazuhiro; Kaneaki, Tetsuhiko; Adachi, Tatsuya; and Matsuda, Sakurako, 4,597,318, Cl. 84-1.220.

Murata, Hiroyuki: *See*—
Misaka, Takaaki; Furukawa, Takeshi; Onuma, Eiichi; Obana, Hiroshi; Fukuyama, Kyosuke; Tanaka, Toshiyuki; Murata, Hiroyuki; and Shimojima, Katuhiko, 4,597,537, Cl. 241-79.100.

Murata Kikai Kabushiki Kaisha: *See*—
Kiriake, Masaharu, 4,597,540, Cl. 242-35.50A.

Murata, Kousaku: *See*—
Kimura, Akira; and Murata, Kousaku, 4,598,046, Cl. 435-70.000.

Murata Manufacturing Co., Ltd.: *See*—
Ito, Satoru, 4,598,163, Cl. 136-213.000.

Murata, Yukio: *See*—
Ohashi, Hiromu; Suzuka, Masakazu; Murata, Yukio; and Fujitsuka, Nobuyoshi, 4,597,670, Cl. 356-405.000.

Muratake, Kiyoshi: *See*—
Wakabayashi, Tetsushi; and Muratake, Kiyoshi, 4,598,307, Cl. 357-75.000.

Murayama, Toru: *See*—
Watanabe, Masaki; Yagasaki, Akio; Murayama, Toru; and Yonekura, Kazuya, 4,597,931, Cl. 264-129.000.

Muroga, Goro: *See*—
Moriya, Kunihiko; Tate, Kazuhito; Muroga, Goro; and Yanagida, Kazuhiro, 4,597,853, Cl. 208-22.000.

Murphy, Edmond J.: *See*—
Fischer, Frederick H.; Murphy, Edmond J.; and Rice, Trudie C., 4,598,039, Cl. 430-323.000.

Murphy, Harold R., to General Electric Company. Replaceable radio antenna. 4,598,295, Cl. 343-702.000.

Murphy, Peter M.: *See*—
Walling, Jorg-Hein; and Murphy, Peter M., 4,597,921, Cl. 264-23.000.

Musgrave, Daniel D. Magazine carrier for use on firearms or other support. 4,597,213, Cl. 42-90.000.

Musolino, Mary T.: *See*—
Goupil, Dennis W.; and Musolino, Mary T., 4,597,843, Cl. 204-165.000.

Myers, Gregory K.: *See*—
Pierce, Gerald A.; and Myers, Gregory K., 4,598,196, Cl. 235-454.000.

Myllymaki, Robert W.: *See*—
Matson, James A.; Myllymaki, Robert W.; Doyle, Terrence W.; and Bush, James A., 4,598,145, Cl. 536-1.100.

Nabisco Brands, Inc.: *See*—
Lynch, Joseph A.; and Ignatuk, Daniel, 4,597,488, Cl. 198-339.100.

Nadler, Gerhard, to Patent-Treuhand Gesellschaft fur elektrische Gluhlampen mbH. Elongated lamp, particularly fluorescent lamp. 4,598,344, Cl. 362-220.000.

Naehmaschinenfabrik Emil Stutznaecker GmbH & Co, KG: *See*—
Stutznacker, Klaus, 4,597,344, Cl. 112-262.300.

Nagano, Masashi, to Shimano Industrial Company Limited. Brake for a bicycle. 4,597,474, Cl. 188-24.210.

Nagano, Mitsuyoshi: *See*—
Wada, Toshiaki; Furukawa, Mitsuhiko; Nagano, Mitsuyoshi; Miyahara, Michito; and Mori, Shigeki, 4,598,052, Cl. 501-87.000.

Nagase, Hidenobu; and Makino, Yuji, to Honda Giken Kogyo Kabushiki Kaisha. Carburetor percolation prevention system. 4,597,915, Cl. 261-29.000.

Nagashima, Mitsukatsu, to Pioneer Electronic Corporation. Collapsible headphone structure. 4,597,469, Cl. 181-129.000.

Nagel, Peter: *See*—
Roller, Hermann; Hack, Joachim; Woweries, Uwe; Lehner, August; Grau, Werner; Nagel, Peter; and Falk, Roland, 4,597,990, Cl. 427-130.000.

Nakada, Saburo: *See*—
Moriya, Takahiko; and Nakada, Saburo, 4,597,167, Cl. 29-590.000.

Nakagawa, Manabu: *See*—
Umetani, Keiji; Suzuki, Atsushi; Nakagawa, Manabu; Yoshida, Minoru; Kawaguchi, Fumio; Yamada, Hiromichi; and Koike, Kouichi, 4,598,203, Cl. 250-366.000.

Nakagawa, Masaya: *See*—
Otake, Noboru; Kawai, Hiroyuki; Hayakawa, Yoichi; Nakagawa, Masaya; Imamura, Kanji; and Tanabe, Kozo, 4,598,146, Cl. 536-6.400.

Nakai, Tetsuya; Mimura, Yoshinori; Shinbori, Osamu; and Tokiwa, Hideharu, to Kokusai Denshin Denwa Co., Ltd. Purifying process of fluoride glass. 4,597,786, Cl. 65-2.000.

Nakajima, Tetsuo; and Aoi, Tomio, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for control of acceleration and deceleration during auto-cruise. 4,598,370, Cl. 364-426.000.

Nakamura, Michael D.: *See*—
Penney, Bruce J.; and Nakamura, Michael D., 4,598,315, Cl. 358-149.000.

Nakamura, Noboru, to Kyocera Corporation. Ceramic pen point and pen provided therewith. 4,597,685, Cl. 401-199.000.

Nakamura, Yuzo, to Nissha Printing Co., Ltd. Transfer printing. 4,597,815, Cl. 156-235.000.

Nakanishi, Masae: *See*—
Ando, Akio; Ochiai, Toshihiko; Nakanishi, Masae; Kawasaki, Shozo; and Nishida, Katsutoshi, 4,597,926, Cl. 264-67.000.

Nakanishi, Nobuyasu: *See*—
Kawaguchi, Hiroshi; Nishina, Shuho; Nakanishi, Nobuyasu; and Honda, Yukio, 4,597,307, Cl. 74-512.000.

Nakano, Hiromichi; Sasaya, Hideaki; and Inagaki, Mitsuo, to Nippon Soken, Inc. Hydraulic fluid supply system with variable pump-displacement arrangement. 4,597,718, Cl. 417-300.000.

Nakaya, Chitose: *See*—
Kanda, Hiroshi; Ishikawa, Isao; Katakura, Kageyoshi; and Nakaya, Chitose, 4,597,293, Cl. 73-606.000.

Nakaya, Tadao, to Mitutoyo Mfg. Co., Ltd. Drivably connecting construction in measuring instrument. 4,597,303, Cl. 74-89.150.

Nakayama, Muneo: *See*—
Nishimura, Toshihiro; Nakayama, Muneo; and Hashimoto, Akira, 4,597,882, Cl. 252-51.000.

Nakazawa, Hideo: *See*—
Oumi, Takeharu; and Nakazawa, Hideo, 4,597,381, Cl. 128-6.000.

Nambu, Tetsuo, to Nippon Tensaiseito Kabushiki Kaisha. Continuous paper-tube potted-seedlings separation transplanting planting machine. 4,597,343, Cl. 111-2.000.

Nanz, Hans: *See*—
Heinemann, Otto; Baldus, Heinz-Dieter; Supp, Armin; Nanz, Hans; Thieme, Helmut; and Rasch, Heinz, 4,597,867, Cl. 210-218.000.

Narita, Haruyoshi, to Nihon Sanso Kabushiki Kaisha; and Shoji Kabushiki Kaisha. Method of killing field mice and the like and apparatus for practicing the method. 4,597,217, Cl. 43-125.000.

Naruse, Yujiro; and Shirouzu, Shunji, to Tokyo Shibaura Denki Kabushiki Kaisha. Storage and reconstruction apparatus for radiation image. 4,598,207, Cl. 250-484.100.

Narvhus, Ingar; and Mikalsen, Jan P., to International Standard Electric Corporation. Controlled parallel converter plant. 4,598,352, Cl. 363-69.000.

Nashef, Aws: *See*—
Hilal, Said S.; and Nashef, Aws, 4,597,766, Cl. 623-13.000.

Nasser, Jennifer A.: *See*—
Zolton, Raymond P.; and Nasser, Jennifer A., 4,597,966, Cl. 424-85.000.

Nath, Prem; and Izu, Masatsugu, to Energy Conversion Devices, Inc. Barrier layer for photovoltaic devices. 4,598,306, Cl. 357-30.000.

National Research Development Corporation: *See*—
Kricka, Larry J.; Thorpe, Gary H. G. H.; and Whitehead, Thomas P., 4,598,044, Cl. 435-28.000.

Nauchno-Issledovatelsky Institut Endokrinologii I Obmena Veschestv: *See*—
Efimov, Andrei S.; Melnik, Igor M.; Tkachuk, Jury V.; Tronko, Nikolai D.; Efimova, Elena K.; Obrosova, Irina G.; Gordienko, Vadim M.; Kaminsky, Leonid A.; Staninets, Vasily I.; Zborovsky, Jury L.; Mokhort, Nikolai A.; and Kirichek, Lora M., 4,598,081, Cl. 514-296.000.

Nauchno-Issledovatelsky Institut Farmakologii I Toksikologii: *See*—
Efimov, Andrei S.; Melnik, Igor M.; Tkachuk, Jury V.; Tronko, Nikolai D.; Efimova, Elena K.; Obrosova, Irina G.; Gordienko, Vadim M.; Kaminsky, Leonid A.; Staninets, Vasily I.; Zborovsky, Jury L.; Mokhort, Nikolai A.; and Kirichek, Lora M., 4,598,081, Cl. 514-296.000.

Nayak, Ramkrishna G.: *See*—
April, Gary C.; and Nayak, Ramkrishna G., 4,597,830, Cl. 162-32.000.

NCR Corporation: *See*—
Lauffer, Donald K.; Rostek, Paul M.; and Sani, Mehdi H., 4,598,216, Cl. 307-443.000.
Smith, Walter A.; Small, James R.; and Ward, Ronald D., Jr., 4,598,410, Cl. 375-3.000.

NEC Corporation: *See*—
Babano, Sotoaki, 4,598,258, Cl. 331-14.000.

Nederlandse Centrale Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek: *See*—
Thijssen, Henricus A. C.; and Arkenbout, Gerardus J., 4,597,768, Cl. 23-299.000.

Neefe, Charles W. Method of removing soft contact lenses from the mold. 4,597,918, Cl. 264-2.600.

Neel, Henri; and Delannoy, Francis, to Atochem. Process for the removal of dissolved gas from an aqueous solution of ethylene oxide. 4,597,833, Cl. 203-49.000.

Neese, Wayne E., to GTE Communication Systems Corporation. High density multi-layer circuit arrangement. 4,598,166, Cl. 174-68.500.

Neier, Benjamin R.; and Stirling, Donald L., to Stirco, Inc. Center discharge mixer for fluent and nonfluent material. 4,597,672, Cl. 366-186.000.

Nekoloff, Michael W.: *See*—
Burton, James O.; Adam, Timothy S.; Budziak, Frank W.; and Nekoloff, Michael W., 4,598,376, Cl. 364-470.000.

Nelson, Gary A.; and Godding, Patrick N., to CXC Corporation. Microtelephone controller. 4,598,397, Cl. 370-110.100.

Nelson, Norman E., to Minnesota Mining and Manufacturing Company. Slack limiter for videocassettes. 4,598,329, Cl. 360-130.210.

Nelson, Richard A.: *See*—
Gardner, Jeffrey B.; Kuiper, Gerald J.; and Nelson, Richard A., 4,598,183, Cl. 200-50.00A.

Nelson, Robert E., to Gillette Company, The. Infrared radiation reference. 4,598,206, Cl. 250-495.100.

Neotechnic Engineering Limited: *See*—
Wilmot, Kenneth, 4,597,512, Cl. 222-402.200.

Nestec S.A.: *See*—
Doster, Robert C.; and Kahn, Karen F., 4,597,976, Cl. 426-325.000.

Nesterchuk, Gennady T.: *See*—
Terentiev, Otto A.; Burov, Anatoly V.; Vorobieva, Ekaterina Y.; Grudinka, Ekaterina I.; Nesterchuk, Gennady T.; Shapovalov, Oleg I.; Usmanov, Khamdam U.; Mirkamilov, Shavkat M.; Mirkamilov, Tolkun M.; and Sharkov, Vladimir V., 4,597,928, Cl. 264-87.000.

Netz, Yoel; and Hoffman, Arnold. Photographic system and process. 4,598,040, Cl. 430-405.000.

Neubauer, Gerald: *See*—
Frank, Gerhard; Neubauer, Gerald; Duffner, Paul; and Wilfinger, Hans J., 4,598,058, Cl. 502-183.000.

Neuhauser, Hans J.; Buran, Ulrich; Fischer, Manfred; and Beyer, Horst, to Goetze AG. Spray powder for producing wear resistant coatings. 4,597,939, Cl. 420-429.000.

Neumann, Bernhard: *See*—
Kochy, Fritz; Brandel, Klaus; Hullmann, Horst; Neumann, Bernhard; and Helmsing, Gerhard, 4,597,461, Cl. 180-90.000.

Neumuenstersche Maschinen- und Apparatebau GmbH: *See*—
Bauch, Ernst; and Vehling, Ernst, 4,597,142, Cl. 28-269.000.

Neville, Antony: *See*—
Beardmore, Geoffrey; and Neville, Antony, 4,597,300, Cl. 74-5.00R.

Newkome, George R., to Research Corporation. Certain polycyclopalladium-bipyridine complexes having anti-tumor activity. 4,598,073, Cl. 514-185.000.

Newton, Kevin H.: *See*—
Hill, Jeffrey A.; Yohn, Robert L.; Modi, Ashok L.; and Newton, Kevin H., 4,597,330, Cl. 101-93.010.

NGK Insulators, Ltd.: *See*—
Mochida, Shigeru; Yamada, Shunichi; and Hamanaka, Toshiyuki, 4,598,054, Cl. 501-112.000.

Nichiyu Giken Kogyo Co., Ltd.: *See*—
Utsugi, Katsumi, 4,598,106, Cl. 523-218.000.

Nickel, Hans: *See*—
Wissmann, Michael; and Nickel, Hans, 4,597,371, Cl. 123-495.000.

Nicolas, Francois: *See*—
Fabre, Jean; Lavalou, Eric; and Nicolas, Francois, 4,597,952, Cl. 423-122.000.

Nieda, Seiichi: *See*—
Fujisaki, Hideaki; Nieda, Seiichi; and Tsunemitsu, Katsuhiko, 4,598,150, Cl. 546-152.000.

Nihon Sanso Kabushiki Kaisha: *See*—
Narita, Haruyoshi, 4,597,217, Cl. 43-125.000.

Niigata Engineering Co., Ltd.: *See*—
Daigou, Yuzuru; and Yagi, Takeo, 4,597,642, Cl. 350-486.000.

Nikaido, Masataka; Kawamoto, Kinji; Murase, Kazuhiro; Kaneaki, Tetsuhiko; Adachi, Tatsuya; and Matsuda, Sakurako, to Matsushita Electric Industrial Co., Ltd. Wave generating method and apparatus using same. 4,597,318, Cl. 84-1.220.

Nilssen, Ole K. High-frequency lighting system. 4,598,232, Cl. 315-225.000.

Nilsson, Karl E.: *See*—
Burghardt, Wilfried; Nilsson, Karl E.; and Ernst, Hans-Hellmut, 4,597,586, Cl. 280-806.000.

Nimberger, Spencer M., to General Screw Products Company. Pressure seal for valve stems and the like. 4,597,581, Cl. 277-12.000.

Nippon Iron Powder Co., Ltd.: *See*—
Honjo, Toshio; and Seki, Yukio, 4,598,034, Cl. 430-106.600.

Nippon Kogaku K. K.: *See*—
Wakabayashi, Hiroshi, 4,597,657, Cl. 354-195.120.

Nippon Kogaku K.K.: *See*—
Hayashi, Yutaka; and Izawa, Hisao, 4,598,242, Cl. 318-640.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Matsui, Seiji; Yatsunami, Kazuharu; Miyashita, Tsuneo; and Sakamoto, Noboru, 4,597,790, Cl. 75-3.000.

Nippon Oil Company, Ltd.: *See*—
Yokoyama, Nobuo, 4,598,019, Cl. 428-407.000.

Nippon Oils & Fats Co., Ltd.: *See*—
Utsugi, Katsumi, 4,598,106, Cl. 523-218.000.

Nippon Petrochemicals Company, Limited: *See*—
Aoyama, Takeo; Magara, Syoji; Yokoyama, Shigeki; Kamei, Tadashi; and Uehara, Mikio, 4,597,818, Cl. 156-308.200.

Nippon Soken, Inc.: *See*—
Nakano, Hiromichi; Sasaya, Hideaki; and Inagaki, Mitsuo, 4,597,718, Cl. 417-300.000.

Nippon Tensaiseito Kabushiki Kaisha: *See*—
Nambu, Tetsuo, 4,597,343, Cl. 111-2.000.

Nippon Tungsten Co., Ltd.: *See*—
Wada, Toshiaki; Furukawa, Mitsuhiko; Nagano, Mitsuyoshi; Miyahara, Michito; and Mori, Shigeki, 4,598,052, Cl. 501-87.000.

Nishida, Katsutoshi: *See*—
Ando, Akio; Ochiai, Toshihiko; Nakanishi, Masae; Kawasaki, Shozo; and Nishida, Katsutoshi, 4,597,926, Cl. 264-67.000.

Nishida, Masaru: *See*—
Hobo, Sumiya; Shimizu, Toshio; and Nishida, Masaru, 4,597,431, Cl. 164-253.000.

Nishikawa, Ikuo, to Kabushiki Kaisha Universal. Device for regulating the direction of rotation of slot machine handle. 4,597,309, Cl. 74-575.000.

Nishikawa, Masao: *See*—
Sakurai, Yoshimi; Aoki, Takashi; and Nishikawa, Masao, 4,597,482, Cl. 192-0.052.

Nishimura, Takumi; and Shibata, Hirochika, to Aisin Seiki Kabushiki Kaisha. Actuator for antiskid device of vehicle. 4,597,611, Cl. 303-116.000.

Nishimura, Tamio; Toku, Hiroshige; Yoshii, Shin; Fukuyasu, Harumi; Matsumoto, Kuniomi; Kazuno, Youzo; and Watanabe, Tetsuro. Antiviral isothiosemicarbazones. 4,598,095, Cl. 514-632.000.

Nishimura, Toshihiro; Nakayama, Muneo; and Hashimoto, Akira, to Tokyo Denshi Kagaku Co., Ltd. Process for regenerating waste oils of synthetic lubricants containing fluorine atom. 4,597,882, Cl. 252-51.000.

Nishina, Shuho: *See*—
Kawaguchi, Hiroshi; Nishina, Shuho; Nakanishi, Nobuyasu; and Honda, Yukio, 4,597,307, Cl. 74-512.000.

Nishino, Takaichi, to Patent Service Corporation. Seat adjuster. 4,597,552, Cl. 248-429.000.

Nishitani, Akito; and Katakura, Yoshiaki, to Oki Electric Industry Co., Ltd. Method of making MIS field effect transistor having a lightly-doped region. 4,597,827, Cl. 156-643.000.

Nishiwaki, Shoji: *See*—
Suzaki, Masayuki; Nishiwaki, Shoji; Hayashima, Toshitaka; Araki, Shigeyuki; and Momose, Masanori, 4,598,301, Cl. 346-76.0PH.

Nishizuka, Hiroshi: *See*—
Morita, Koyo; Nomura, Keizo; Nishizuka, Hiroshi; Hoshi, Tai; Tamiya, Yoichiro; and Asakawa, Terushige, 4,598,197, Cl. 250-205.000.

Nissan Motor Co., Ltd.: *See*—
Hayashi, Yoshimasa, 4,597,367, Cl. 123-188.0AA.
Tanaka, Yoshikazu; Yamamuro, Sigeaki; Abo, Keiju; Kumura, Haruyoshi; Hirano, Hiroyuki; and Morimoto, Yoshiro, 4,597,308, Cl. 74-866.000.
Tsuji, Shinsaku, 4,597,306, Cl. 74-473.00P.
Yasuhara, Seishi, 4,597,369, Cl. 123-458.000.

Nissha Printing Co., Ltd.: *See*—
Nakamura, Yuzo, 4,597,815, Cl. 156-235.000.

Nissin-High Voltage Co. Ltd.: *See*—
Matsuda, Koji; Takagi, Toshinori; and Ishikawa, Junzo, 4,598,231, Cl. 315-111.810.

Nitsuko Limited: *See*—
Yoshida, Tadahiro, 4,598,412, Cl. 375-94.000.

Nitz, Rolf-Eberhard: *See*—
Beyerle, Rudi; Bender, Heinz; Schindler, Ursula; Nitz, Rolf-Eberhard; and Martorana, Piero A., 4,598,079, Cl. 514-252.000.

Nof, Asher. Container for self-cooling the liquid contents thereof. 4,597,271, Cl. 62-294.000.

Noji, Takashi: *See*—
Obata, Yoshiharu; Noji, Takashi; Sugiyama, Masahiro; and Kawamura, Shigeharu, 4,598,228, Cl. 313-475.000.

Nomura, Keizo: *See*—
Morita, Koyo; Nomura, Keizo; Nishizuka, Hiroshi; Hoshi, Tai; Tamiya, Yoichiro; and Asakawa, Terushige, 4,598,197, Cl. 250-205.000.

Nonaka, Chiaki. Optical reproducing apparatus with fast access mode operation. 4,598,394, Cl. 369-44.000.

Noranda Inc.: *See*—
Rosenblum, Frank; and Labuc, Vladimir M., 4,597,507, Cl. 222-16.000.

Norigoe, Takashi; and Ochiai, Kuniaki, to Tokyo Electric Co., Ltd. Dot printer head with alternate magnetic flux paths. 4,597,680, Cl. 400-124.000.

Norland, Kenneth S.: *See—*
Rogers, Howard G.; Gaudiana, Russell A.; McGowan, Cynthia B.; Norland, Kenneth S.; and Sahatjian, Ronald J., 4,597,891, Cl. 252-299.100.
Norman, Robert W., Jr.: *See—*
Boothroyd, Donald C.; and Norman, Robert W., Jr., 4,598,359, Cl. 364-200.000.
Boothroyd, Donald C.; Norman, Robert W., Jr.; and Keller, Howard J., 4,598,365, Cl. 364-200.000.
Norminton, Robert S. Compact towing system for underwater bodies. 4,597,352, Cl. 114-254.000.
Noro, Takanobu: *See—*
Ushifusa, Nobuyuki; Ogihara, Satoru; and Noro, Takanobu, 4,598,167, Cl. 174-68.500.
Norrgran, Daniel A.; and Davis, William B., to Atlantic Richfield Company. Process for producing an upgraded sulfide mineral concentrate from an ore containing sulfide mineral and silicate clay. 4,597,857, Cl. 209-166.000.
North American Specialties Corporation: *See—*
Seidler, Jack, 4,597,625, Cl. 339-176.00M.
Seidler, Jack, 4,597,628, Cl. 339-275.00T.
North Wind Power Company, Inc.: *See—*
Coleman, Clint, 4,597,715, Cl. 416-229.00R.
Northern Telecom Limited: *See—*
Read, Clifford D., 4,598,175, Cl. 179-100.00C.
Ryan, Desmond J.; and Bertignoll, Friedrich, 4,598,176, Cl. 179-103.000.
Walling, Jorg-Hein; and Murphy, Peter M., 4,597,921, Cl. 264-23.000.
Northwest Podiatric Laboratories, Inc.: *See—*
Brown, Dennis N., 4,597,196, Cl. 36-44.000.
Novo Industri A/S: *See—*
Diderichsen, Boerge K.; and Christiansen, Lars, 4,598,048, Cl. 435-172.300.
Lundt, Behrend F.; Jorgensen, Karin D.; Johansen, Nils L.; Gronvald, Frederik C.; Frandsen, Erik K.; Moody, Alister J.; and Markussen, Jan, 4,598,065, Cl. 514-12.000.
Nowacki, Christopher; and Brisson, Alfred G., to Trutek Research, Inc. Pressure monitor. 4,598,279, Cl. 340-626.000.
Nowacki, Christopher: *See—*
Koziol, Jeffrey; Nowacki, Christopher; and Brisson, Alfred G., 4,597,388, Cl. 128-303.100.
Nozaka, Yoshiki, to Dai Nippon Insatsu Kabushiki Kaisha. Method of and device for preparing paper rolls for rotary presses and the like. 4,597,820, Cl. 156-353.000.
Nozawa, Yoshio: *See—*
Kitayama, Yukio; Ochiai, Izumi; Nozawa, Yoshio; Miyagi, Masahiro; Ayabe, Tadaaki; and Uehara, Katsuharu, 4,597,171, Cl. 29-727.000.
NRM Corporation: *See—*
Singh, Anand P.; and Knoedler, Norman R., 4,597,729, Cl. 425-38.000.
NSK-Warner K.K.: *See—*
Kawai, Osamu, 4,597,588, Cl. 280-808.000.
Nufer, Robert W.: *See—*
Herron, Lester W.; and Nufer, Robert W., 4,598,107, Cl. 523-351.000.
Nukaya, Yasuyuki, to Ricoh Co., Ltd. Original supply apparatus for use in copying machine. 4,597,572, Cl. 271-171.000.
Numann, Friedmund: *See—*
Schweikert, Hans-Udo; Tunn, Ulf; Senge, Theodor; and Numann, Friedmund, 4,598,072, Cl. 514-170.000.
O. M. Scott & Sons Company, The: *See—*
Kise, Jay R., 4,597,531, Cl. 239-650.000.
Obana, Hiroshi: *See—*
Misaka, Takaaki; Furukawa, Takeshi; Onuma, Eiichi; Obana, Hiroshi; Fukuyama, Kyosuke; Tanaka, Toshiyuki; Murata, Hiroyuki; and Shimojima, Katuhiko, 4,597,537, Cl. 241-79.100.
Obata, Yoshiharu; Noji, Takashi; Sugiyama, Masahiro; and Kawamura, Shigeharu, to Kabushiki Kaisha Toshiba. High resolution output structure for an image tube which minimizes Fresnel reflection. 4,598,228, Cl. 313-475.000.
Oberlin, Dirk: *See—*
Weber, Kenneth E.; and Oberlin, Dirk, 4,598,105, Cl. 523-215.000.
Oboshi, Takamitsu; Koga, Tomoaki; and Imoto, Eiji, to Mitsui High-Tec, Inc. Method and apparatus for producing laminated iron cores. 4,597,168, Cl. 29-596.000.
Obrecht, Georges, to Alsthom-Atlantique. Device for measuring stresses transmitted by a shaft, in particular to a drill bit. 4,597,289, Cl. 73-151.000.
O'Brien, Dennis; and Smith, Graham, to Mobil Oil Corporation. Thermoplastic bag having reinforced handles and method of manufacture. 4,597,749, Cl. 493-226.000.
O'Brien, Lawrence B.; and Messick, Walker A., to Black & Decker Inc. Painting roller assembly. 4,597,684, Cl. 401-197.000.
Obrosova, Irina G.: *See—*
Efimov, Andrei S.; Melnik, Igor M.; Tkachuk, Jury V.; Tronko, Nikolai D.; Efimova, Elena K.; Obrosova, Irina G.; Gordienko, Vadim M.; Kaminsky, Leonid A.; Staninets, Vasily I.; Zborovsky, Jury L.; Mokhort, Nikolai A.; and Kirichek, Lora M., 4,598,081, Cl. 514-296.000.
Occidental Chemical Corporation: *See—*
Stodolka, Mark J., 4,597,803, Cl. 134-10.000.
Ocenco Incorporated: *See—*
Droppleman, J. Patrick; Olson, Iner C.; Phillip, Jeffrey S.; and Berning, Steven K., 4,597,137, Cl. 24-33.00P.
Ochiai, Izumi: *See—*
Kitayama, Yukio; Ochiai, Izumi; Nozawa, Yoshio; Miyagi, Masahiro; Ayabe, Tadaaki; and Uehara, Katsuharu, 4,597,171, Cl. 29-727.000.
Ochiai, Kuniaki: *See—*
Norigoe, Takashi; and Ochiai, Kuniaki, 4,597,680, Cl. 400-124.000.
Ochiai, Toshihiko: *See—*
Ando, Akio; Ochiai, Toshihiko; Nakanishi, Masae; Kawasaki, Shozo; and Nishida, Katsutoshi, 4,597,926, Cl. 264-67.000.
Oda, Kazutaka; Kon, Yoshio; and Kakei, Tsutomu, to Fuji Photo Film Co., Ltd. Method and apparatus for electrolytic treatment. 4,597,837, Cl. 204-14.100.
Odaka, Kentaro, to Sony Corporation. Encoding method for error correction. 4,598,403, Cl. 371-39.000.
O'Donohue, Thomas L.: *See—*
Rice, Kenner C.; Rafferty, Michael F.; Jacobson, Arthur E.; Contreras, Patricia; O'Donohue, Thomas L.; Lessor, Ralph A.; and Mattson, Mariena V., 4,598,153, Cl. 546-229.000.
Oelhafen, Peter: *See—*
Freeouf, John L.; Jackson, Thomas N.; Oelhafen, Peter; Pettit, George D.; and Woodall, Jerry M., 4,597,825, Cl. 156-643.000.
Oetiker, Hans; and Kummer, Emanuel, to Gebruder Buhler AG. Process and apparatus for controlling a controllable magnitude and use of the process. 4,597,405, Cl. 137-14.000.
Officine Vittoria S.p.A.: *See—*
Camerini, Pier Cesare P., 4,597,190, Cl. 34-57.00A.
Ofusa, Masaatsu, to Yoshida Kogyo K. K. Woven slide fastener. 4,597,418, Cl. 139-384.00B.
Ogawa, Atsushi: *See—*
Majima, Shinichi; and Ogawa, Atsushi, 4,598,244, Cl. 323-351.000.
Ogihara, Satoru: *See—*
Ushifusa, Nobuyuki; Ogihara, Satoru; and Noro, Takanobu, 4,598,167, Cl. 174-68.500.
OGM Trading ApS: *See—*
Martinsen, Ove, 4,597,515, Cl. 223-43.000.
Oguma, Tomio: *See—*
Hirashiba, Yuji; Kawai, Shinji; and Oguma, Tomio, 4,597,111, Cl. 4-420.400.
Oguri, Yukio: *See—*
Sasaki, Mitsuru; and Oguri, Yukio, 4,598,092, Cl. 514-492.000.
Ohashi, Hiromu; Suzuka, Masakazu; Murata, Yukio; and Fujitsuka, Nobuyoshi, to Sumitomo Chemical Company, Limited. Method of measuring color difference of dyestuffs. 4,597,670, Cl. 356-405.000.
Ohhara, Syuichi: *See—*
Watanabe, Noboru; Tokoro, Hisao; and Ohhara, Syuichi, 4,598,001, Cl. 428-31.000.
Ohkura Electric Co., Ltd.: *See—*
Motomiya, Takehiko, 4,597,291, Cl. 73-432.0AD.
Ohlinger, Rainer: *See—*
Zeitler, Gerhard; Werner, Frank; Bittner, Gerhard; Baumann, Karl-Heinz; Roeber, Artur; Metzinger, Lothar; Ohlinger, Rainer; and Zettler, Hans D., 4,597,927, Cl. 264-85.000.
Ohmura, Jukichi: *See—*
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,597,913, Cl. 558-436.000.
Ohno, Shigeru: *See—*
Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, 4,598,032, Cl. 430-58.000.
Ohnuki, Yukihiko: *See—*
Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, 4,598,032, Cl. 430-58.000.
Ohse, Hidetaka: *See—*
Yoshioka, Susumu; Matsuo, Nobuo; Meguri, Nobuyasu; Murakami, Tadashi; Ishibashi, Yasushi; Matsuda, Kenichi; Suzuka, Teruo; Fukase, Satoshi; and Ohse, Hidetaka, 4,597,856, Cl. 208-112.000.
Ohshima, Satoshi: *See—*
Oine, Toyonari; Sugano, Hiroshi; Yamada, Yoshihisa; Yamaguchi, Totaro; and Ohshima, Satoshi, 4,598,075, Cl. 514-203.000.
Oine, Toyonari; Sugano, Hiroshi; Yamada, Yoshihisa; Yamaguchi, Totaro; and Ohshima, Satoshi, 4,598,154, Cl. 548-194.000.
Ohta, Takahiro, to Fuji Photo Film Co., Ltd. Color optical printer head having a liquid crystal layer. 4,597,637, Cl. 350-339.00F.
Ohta, Tokuya; Yano, Yasuhiro; Matsufuji, Yohji; Haruta, Masahiro; and Eida, Tsuyoshi, to Canon Kabushiki Kaisha. Recording process and a recording liquid thereof. 4,597,794, Cl. 106-20.000.
Ohtake, Fumio: *See—*
Hamada, Masami; Tanaka, Kiyokazu; Kikuchi, Takeshi; Asai, Yasuhiro; Hayashi, Chihiro; and Ohtake, Fumio, 4,597,278, Cl. 72-187.000.
Ohwaki, Takayuki; Sakashita, Shigeru; Kawahara, Masahiro; Shinoda, Aishin; and Miyake, Yasuo, to Eisai Co., Ltd. Tripamide and cyclodextrin inclusion compound. 4,598,070, Cl. 514-58.000.
Oine, Toyonari; Sugano, Hiroshi; Yamada, Yoshihisa; Yamaguchi, Totaro; and Ohshima, Satoshi, to Tanabe Seiyaku Co., Ltd. Cephalosporin compounds. 4,598,075, Cl. 514-203.000.
Oine, Toyonari; Sugano, Hiroshi; Yamada, Yoshihisa; Yamaguchi, Totaro; and Ohshima, Satoshi, to Tanabe Seiyaku Co., Ltd. Thiazole intermediates for cephalosporin compounds. 4,598,154, Cl. 548-194.000.
Oka, Syotaro; Tahara, Shu; and Shibazaki, Yaichiro, to Shimadzu Corporation. Electrode for measurement of ion activity. 4,597,848, Cl. 204-418.000.
Okada, Yoshio; and Igarashi, Yuriko, to Kureha Kagaku Kogyo Kabushiki Kaisha. Partially pressure-sensitized recording paper and process for preparing the same. 4,597,993, Cl. 427-150.000.

O'Keefe, John D., to TRW Inc. High extraction efficiency cylindrical ring resonator. 4,598,408, Cl. 372-94.000.

Oki Electric Industry Co., Ltd.: *See*—
Nishitani, Akito; and Katakura, Yoshiaki. 4,597,827, Cl. 156-643.000.

Okouchi, Isao; Izumi, Kenkichi; Takahashi, Sankichi; Mukai, Yasuteru; and Tomida, Akira, to Hitachi, Ltd. Apparatus for removing foreign matters. 4,597,871, Cl. 210-456.000.

Oku, Koichi; and Matsuura, Kiyoshi, to Japan Metals and Chemicals Co., Ltd. Process for electrolytically producing metallic oxide for ferrite. 4,597,957, Cl. 423-594.000.

Okubo, Naofumi: *See*—
Saito, Toshiyuki; Okubo, Naofumi; Kaneko, Yoshiaki; and Tokumitsu, Yasuyuki, 4,598,254, Cl. 330-286.000.

Okutu, Toshimitu: *See*—
Miyoshi, Takahito; Masuyama, Kenichi; Okutu, Toshimitu; Utumi, Masahiro; Fujiyama, Masaaki; and Kanazawa, Minoru, 4,598,014, Cl. 428-323.000.

Oldendorf, Christian: *See*—
Knothe, Erich; Melcher, Franz-Josef; and Oldendorf, Christian, 4,597,458, Cl. 177-164.000.

Olin Corporation: *See*—
Haque, Reza; Smith, Edward F., III; and Kadija, Igor V., 4,598,022, Cl. 428-413.000.

Ollinger, James C.; and Shaub, Melvin H., to Armstrong World Industries, Inc. Method of attaching a metal covering to a ceiling board. 4,598,010, Cl. 428-172.000.

Ollis, Frederick R.; and Tengler, John N., to Minnesota Mining and Manufacturing Company. Wire stripping machine. 4,597,156, Cl. 29-564.400.

Olofsson Corporation, The: *See*—
Garnett, Donald W.; and Watson, John A., 4,597,155, Cl. 29-564.000.

Olsen, Robert W., to Construction Specialties, Inc. Panel wall system. 4,597,235, Cl. 52-509.000.

Olson, Iner C.: *See*—
Droppleman, J. Patrick; Olson, Iner C.; Phillip, Jeffrey S.; and Berning, Steven K., 4,597,137, Cl. 24-33.00P.

OMI International Corporation: *See*—
Bammel, Brian D., 4,597,838, Cl. 204-44.200.

Ono, Akinobu: *See*—
Sugisawa, Ko; Sekiguchi, Kazuya; Tsuzi, Kiyoaki; and Ono, Akinobu, 4,597,945, Cl. 422-113.000.

Ono, Akira, to Tokyo Shibaura Denki Kabushiki Kaisha. Device for checking positional accuracy. 4,597,668, Cl. 356-372.000.

Ono, Ken'ichi, to Kabushiki Kaisha Toshiba. Image building apparatus. 4,598,300, Cl. 346-76.0PH.

Ono, Yukio: *See*—
Kitano, Seiichi; and Ono, Yukio, 4,597,479, Cl. 192-18.00R.

Onoda Cement Company, Ltd.: *See*—
Misaka, Takaaki; Furukawa, Takeshi; Onuma, Eiichi; Obana, Hiroshi; Fukuyama, Kyosuke; Tanaka, Toshiyuki; Murata, Hiroyuki; and Shimojima, Katuhiko, 4,597,537, Cl. 241-79.100.

Onoue, Makoto: *See*—
Inoue, Kiyoshi; Onoue, Makoto; and Sano, Sadao, 4,598,189, Cl. 219-69.00W.

Onuma, Eiichi: *See*—
Misaka, Takaaki; Furukawa, Takeshi; Onuma, Eiichi; Obana, Hiroshi; Fukuyama, Kyosuke; Tanaka, Toshiyuki; Murata, Hiroyuki; and Shimojima, Katuhiko, 4,597,537, Cl. 241-79.100.

Opitz, Norbert; and Lubbers, Dietrich W., to Max Planck Gesellschaft. Arrangement for measuring diffusing particles. 4,597,392, Cl. 128-637.000.

Optimetrix Corporation: *See*—
Johannsmeier, Karl-Heinz; and Phillips, Edward H., 4,597,664, Cl. 355-43.000.

Orian, Michel A., to Glaenzer Spicer. Elastic protective bellows for a homokinetic transmission joint. 4,597,745, Cl. 464-173.000.

Orlowski, Ronald C.; and Seyler, Jay K., to Armour Pharmaceutical Co. Des^{2}-glycine^{8}-des^{22}-calcitonin. 4,597,900, Cl. 530-307.000.

Ortech Electronics Inc.: *See*—
Geissler, Robert G.; and D'Elio, Carmine, 4,598,312, Cl. 358-118.000.

Ortho Diagnostic Systems, Inc.: *See*—
Zolton, Raymond P.; and Nasser, Jennifer A., 4,597,966, Cl. 424-85.000.

Osakabe, Yoshio; and Suzuki, Tadao, to Sony Corporation. Remote control apparatus. 4,598,287, Cl. 340-825.240.

Oscar Mayer Foods Corporation: *See*—
Vedvik, Andrew H.; and Merdler, Myron J., 4,597,704, Cl. 414-28.000.

Ostlinning, Edgar; Idel, Karsten; Eisermann, Wolfgang M.; and Freitag, Dieter, to Bayer Aktiengesellschaft. Process for the production of high molecular weight, optionally branched polyarylene sulphides. 4,598,144, Cl. 528-388.000.

Otake, Noboru; Kawai, Hiroyuki; Hayakawa, Yoichi; Nakagawa, Masaya; Imamura, Kanji; and Tanabe, Kozo, to Kirin Beer Kabushiki Kaisha. Compound, arugomycin. 4,598,146, Cl. 536-6.400.

Otaki, Hiroyuki: *See*—
Matsunaga, Katsuo; Kanbe, Osami; and Otaki, Hiroyuki, 4,598,222, Cl. 310-198.000.

Otobe, Yutaka: *See*—
Yasuoka, Akimasa; and Otobe, Yutaka, 4,597,370, Cl. 123-493.000.

Otremba, Harvey E. Powered jigging device. 4,597,215, Cl. 43-19.200.

Otsubo, Koichi: *See*—
Kusuhara, Rei; Otsubo, Koichi; and Yatabe, Yasuo, 4,597,819, Cl. 156-345.000.

Oumi, Takeharu; and Nakazawa, Hideo, to Aisin Seiki Kabushiki Kaisha. Apparatus for monitoring an artificial internal organ. 4,597,381, Cl. 128-6.000.

Outboard Marine Corporation: *See*—
Petersen, H. Norman, 4,597,686, Cl. 403-11.000.

Overfield, Richard B.: *See*—
Baldauf, Lawrence M.; Girvan, Edward J.; Overfield, Richard B.; and Roberts, Gilbert C., 4,597,177, Cl. 29-878.000.

Ovshinsky, Stanford R.: *See*—
Johnson, Robert R.; and Ovshinsky, Stanford R., 4,597,162, Cl. 29-574.000.

Oy Wartsila Ab: *See*—
Kultaranta Tapani, 4,597,326, Cl. 100-50.000.

Pabis, David M. Wood burning furnace. 4,597,375, Cl. 126-117.000.

Pacanowski, Ronald F.: *See*—
Kuchar, Paul J.; Sampson, Robert W.; and Pacanowski, Ronald F., 4,597,285, Cl. 73-29.000.

Padgett, Edwin. Suntanning device. 4,597,119, Cl. 5-431.000.

Pagan, Augustine J., to Whittaker Corporation. Sucker rod assembly and method. 4,597,688, Cl. 403-265.000.

Page, Philip R., to Hovione Inter Ltd. Process for the preparation of α-6-deoxy-tetracyclines. 4,597,904, Cl. 260-351.500.

Palosi, Eva: *See*—
Toth, Edit; Torley, Jozsef; Palosi, Eva; Szebereneyi, Szabolcs; Szporny, Laszlo ; Gorog, Sandor; and Hajdu, Istvan, 4,598,080, Cl. 514-277.000.

Paluka, Charles F.: *See*—
Moore, M. Samuel; and Paluka, Charles F., 4,597,259, Cl. 60-39.091.

Pann, Keh, to Mobil Oil Corporation. Vibratory signal sweep seismic prospecting method and apparatus. 4,598,392, Cl. 367-32.000.

Pannu, Kulbir: *See*—
Raghavan, Vijaya G. S.; and Pannu, Kulbir, 4,597,737, Cl. 432-197.000.

Panttila, Vaino, to Valmet Oy. Drive arrangement for cylinders in a paper machine. 4,597,310, Cl. 74-665.0GA.

Panush, Sol, to Inmont Corporation. Multilayer satin finish automotive paint system. 4,598,015, Cl. 428-324.000.

Panush, Sol, to Inmont Corporation. Automotive paint compositions containing pearlescent pigments and dyes. 4,598,020, Cl. 428-411.100.

Papahadjopoulos, Demetrios P.; and Heath, Timothy D., to University of California, The Regents of the. Liposome conjugates and diagnostic methods therewith. 4,598,051, Cl. 436-512.000.

Papouchis, George A. Protective wrapper for printed material. 4,597,590, Cl. 281-34.000.

Papst-Motoren GmbH & Co. KG: *See*—
Cap, Heinrich, 4,598,239, Cl. 318-314.000.

Papuga, Donald M.: *See*—
Robeson, Lloyd M.; and Papuga, Donald M., 4,598,130, Cl. 525-439.000.

Pargeter, John K.: *See*—
Hanewald, Richard H.; and Pargeter, John K., 4,597,564, Cl. 266-274.000.

Parker Chemical Company: *See*—
Hauffe, Dieter, 4,597,806, Cl. 148-6.15Z.
King, Peter F., 4,597,888, Cl. 252-135.000.

Parker, John A.: *See*—
Kourtides, Demetrius A.; Parker, John A.; and Hsu, Ming-Ta S., 4,598,007, Cl. 428-116.000.

Parker, Wendell E., to Kelsey-Hayes Company. Apparatus for filling and sealing a container. 4,597,245, Cl. 53-510.000.

Parkinson, Kenneth: *See*—
Kennedy, Peter; and Parkinson, Kenneth, 4,597,923, Cl. 264-29.400.

Pasour, John A.: *See*—
Mako, Frederick M.; Pasour, John A.; and Roberson, Charles W., 4,598,247, Cl. 324-77.00R.

Pass, Michel, to Essilor International (Compagnie Generale d'Optique). Nasal equipment for spectacle frame and corresponding spectacle frame. 4,597,647, Cl. 351-133.000.

Passarotti, Carlo: *See*—
Doria, Gianfederico; Passarotti, Carlo; and Buttinoni, Ada, 4,598,090, Cl. 514-455.000.

Patel, Mahesh G.: *See*—
Waitz, Jay A.; Patel, Mahesh G.; Marquez, Joseph A.; Kalyanpur, Manohar G.; and Horan, Ann C., 4,597,968, Cl. 424-118.000.

Patent Service Corporation: *See*—
Nishino, Takaichi, 4,597,552, Cl. 248-429.000.

Patent-Treuhand Gesellschaft fur elektrische Gluhlampen mbH: *See*—
Nadler, Gerhard, 4,598,344, Cl. 362-220.000.

Paterlini, Romualdo, to Coopsette S.C.R.L. Sanitary facility with means for automatic cleaning. 4,597,114, Cl. 4-662.000.

Paul, Richard N., to Bostitch Division of Textron Inc. Stapler with improved magazine cover construction. 4,597,518, Cl. 227-128.000.

Paul Wurth S.A.: *See*—
Legille, Edouard; Mailliet, Pierre; Loutsch, Jeannot; and Welter, Jean-Pierre, 4,597,694, Cl. 406-129.000.

Pearson, Herby O.: *See*—
Fister, Louis P.; Fitch, Lawrence H.; and Pearson, Herby O., 4,597,150, Cl. 29-407.000.

Peck, Paul L., to Archery Designs, Inc. Tree stand. 4,597,473, Cl. 182-187.000.

Pedersen, Mark K.: *See—*
Bacon, Jeffery E.; Craig, James E.; and Pedersen, Mark K., 4,597,845, Cl. 204-206.000.

Peekema, Thomas E.; and Beehler, James O., to Tektronix, Inc. Method and apparatus for operating an ink jet head of an ink jet printer. 4,598,303, Cl. 346-140.00R.

Pellman, Mark A.: *See—*
Fenstermaker, Michael L.; and Pellman, Mark A., 4,597,807, Cl. 148-16.500.

Penick, Joe E., to Mobil Oil Corporation. Multi-bed hydrodewaxing process. 4,597,854, Cl. 208-58.000.

Penney, Bruce J., to Tektronix, Inc. Method and apparatus for processing an analog signal. 4,598,269, Cl. 340-347.0AD.

Penney, Bruce J.; and Nakamura, Michael D., to Tektronix, Inc. Signal processing apparatus and method of operating such apparatus. 4,598,315, Cl. 358-149.000.

Pentapharm AG: *See—*
Svendsen, Lars G., 4,598,043, Cl. 435-13.000.

Peppers, James E., to FL Industries, Inc. Heat sink floodlight casing and reflector. 4,598,347, Cl. 362-373.000.

Peppers, Norman A.: *See—*
Pierce, Gerald A.; Buxton, James L.; Peppers, Norman A.; and Vinzant, Warren J., 4,598,393, Cl. 369-46.000.

Pereira, LeRoy A., to McKesson Corporation. Drinking water dispensing unit and method. 4,597,509, Cl. 222-129.000.

Perez, Raul, Jr. Medical speculum and procedure. 4,597,382, Cl. 128-17.000.

Perkins, Jeffrey J.: *See—*
Vohr, John H.; Miller, William H.; and Perkins, Jeffrey J., 4,597,676, Cl. 384-114.000.

Perry, Frederick G.; and Fisher, John, to BP Nutrition (UK) Limited. Pig feedstuff. 4,598,097, Cl. 514-738.000.

Perry, Thomas J., to GTE Automatic Electric Inc. Digital span conversion circuit. 4,598,268, Cl. 340-347.0DD.

Perry, Thomas J.; and Khera, Muhammad I., to GTE Automatic Electric Inc. Data format arrangement for communication between the peripheral processors of a telecommunications switching network. 4,598,404, Cl. 371-49.000.

Persbeck, Sven-Eric, to Salen & Wikander AB. Tool holder for thermic cutting rods. 4,597,563, Cl. 266-77.000.

Peters, John W.: *See—*
Scapple, Robert Y.; Peters, John W.; Linder, Jacques F.; and Yee, Edward M., 4,597,986, Cl. 427-53.100.

Petersen, H. Norman, to Outboard Marine Corporation. Quick release connecting assembly. 4,597,686, Cl. 403-11.000.

Petersen, Hans C.; Thomsen, Svend E.; and Hansen, Hans L., to Danfoss A/S. Rotary piston machine with parallel internal axes. 4,597,725, Cl. 418-61.00B.

Peterson, Per V.: *See—*
Andersson, Per-Erik; Annergren, Goran E.; Hoglund, Hans E.; and Peterson, Per V., 4,597,872, Cl. 210-605.000.

Petrizza, Norbert: *See—*
Frank, Hans-Eberhard; and Petrizza, Norbert, 4,597,144, Cl. 29-40.000.

Pettit, George D.: *See—*
Freeouf, John L.; Jackson, Thomas N.; Oelhafen, Peter; Pettit, George D.; and Woodall, Jerry M., 4,597,825, Cl. 156-643.000.

Pharmacaps, Inc.: *See—*
Berry, Ira R.; Shah, Dilip; and Borkan, Lionel, 4,597,885, Cl. 252-93.000.

Pharo, Daniel A., to M & D Balloons, Inc. Method for forming an inflated wrapping. 4,597,244, Cl. 53-434.000.

Phillip, Jeffrey S.: *See—*
Droppleman, J. Patrick; Olson, Iner C.; Phillip, Jeffrey S.; and Berning, Steven K., 4,597,137, Cl. 24-33.00P.

Phillips, Anthony J.: *See—*
Maxfield, Howard C.; Phillips, Anthony J.; and Yarwood, Richard J., 4,597,969, Cl. 424-157.000.

Phillips, Edward H.: *See—*
Johannsmeier, Karl-Heinz; and Phillips, Edward H., 4,597,664, Cl. 355-43.000.

Phillips Petroleum Company: *See—*
Randall, James C.; and Whitte, William M., 4,598,128, Cl. 525-240.000.
Stapp, Paul R., 4,597,855, Cl. 208-61.000.

Picker International, Inc.: *See—*
Wang, Shih-Ping; Morgan, Russell H.; and Specht, Donald F., 4,598,369, Cl. 364-414.000.

Pierce, Gerald A.; and Myers, Gregory K., to Drexler Technology Corporation. Debit card. 4,598,196, Cl. 235-454.000.

Pierce, Gerald A.; Buxton, James L.; Peppers, Norman A.; and Vinzant, Warren J., to Drexler Technology Corporation. Three-beam optical servo tracking system with two-track parallel readout. 4,598,393, Cl. 369-46.000.

Pieroh, Ernst A.: *See—*
Skotsch, Carlo; Joppien, Hartmut; and Pieroh, Ernst A., 4,598,083, Cl. 514-357.000.

Pilot Man-Nen-Hitsu Kabushiki Kaisha: *See—*
Sato, Morio; and Igawa, Tatsuya, 4,597,829, Cl. 156-644.000.

Pinckney Molded Plastics, Inc.: *See—*
Kreeger, Elsmer W., 4,597,338, Cl. 108-51.100.

Pioneer Electronic Corporation: *See—*
Nagashima, Mitsukatsu, 4,597,469, Cl. 181-129.000.
Takagi, Kazunori; Soma, Hiroshi; Miyata, Yoshiaki; Motozawa, Yasuki; and Katou, Hitoshi, 4,597,470, Cl. 181-141.000.

Pioneer Products, Inc.: *See—*
Kaplan, Steve E., 4,597,496, Cl. 211-70.600.

Piosenka, Gerald V.; and Mead, Barry B., to Motorola, Inc. Secure microprocessor. 4,598,170, Cl. 178-22.080.

Ploeger, Dale: *See—*
Swidler, Ron; and Ploeger, Dale, 4,598,302, Cl. 346-76.0PH.

Plzak, Voitech: *See—*
Kiessling, Rainer; Plzak, Voitech; and Wendt, H., 4,597,841, Cl. 204-115.000.

Pneumatic Scale Corporation: *See—*
Scully, John W., 4,597,240, Cl. 53-57.000.

Podvin, T. Charles; and Van Benschoten, Peter J., to Micromanipulator Microscope Company, Inc., The. Pivotable filter holder for microscopes. 4,597,643, Cl. 350-507.000.

Pohl, Joachim: *See—*
Schneider, Michael; Pohl, Joachim; Kochloefl, Karel; and Bock, Ortwin, 4,598,062, Cl. 502-306.000.

Pokorny, L. Robert: *See—*
Pokorny, Louis, Jr.; and Pokorny, L. Robert, 4,597,115, Cl. 5-13.000.

Pokorny, Louis, Jr.; and Pokorny, L. Robert, to Louis Pokorny Company, Inc. Low seating level sofa-bed mechanism. 4,597,115, Cl. 5-13.000.

Polaroid Corporation: *See—*
Edwards, Brooks, 4,597,905, Cl. 260-377.000.
Rogers, Howard G.; Gaudiana, Russell A.; McGowan, Cynthia B.; Norland, Kenneth S.; and Sahatjian, Ronald J., 4,597,891, Cl. 252-299.100.

Polaroid Corporation, Patent Dept.: *See—*
Herchen, Stephen R.; and Widiger, Gary N., 4,598,158, Cl. 549-394.000.

Pollard, Jerry B., to Coleman Company, Inc., The. Non-conducting mast for sailboats. 4,597,346, Cl. 114-39.000.

Pollhammer, Edgar: *See—*
Matz, Klaus; Ritter, Gerhard; Ritter, Klaus; and Pollhammer, Edgar, 4,597,239, Cl. 52-644.000.

Pollock, Rodney E.: *See—*
Reba, Imants; and Pollock, Rodney E., 4,597,573, Cl. 271-195.000.

Pommer, Karl E., II, to GTE Communication Systems Corp. Circuit for detecting keypad conditions in a microprocessor controlled telephone instrument. 4,598,174, Cl. 179-84.0VF.

Ponticello, Gerald S., to Merck & Co., Inc. 3-amino-2-hydroxypropyl of pyrimidin-4-one useful as antihypertensive, cardioprotective, antiarrythmic, and antianginal agents. 4,598,149, Cl. 544-319.000.

Poque , Dionysius: *See—*
Mauk, Gerhard; Huinink, Heinrich; Seitz, Hans; Frerichs, Udo; Rach, Heinz-Dieter; and Poque , Dionysius, 4,597,426, Cl. 152-379.500.

Porel, Louis-Claude; and Cyphelly, Ivan, to Hydro Rene Allee Rene Leduc Azerailles; and Glyco Antriebs Technick GmbH. Hydrostatic clutch. 4,597,483, Cl. 192-59.000.

Porters Grove Metal Recovery Co., Inc.: *See—*
Evans, Joseph P., 4,597,842, Cl. 204-130.000.

Possati, Mario: *See—*
Golinelli, Guido; and Possati, Mario, 4,597,184, Cl. 33-143.00F.

Pothuri, Reddeppa N.: *See—*
Chea, Ramon C. W., Jr.; Keegan, Kevin C.; Pothuri, Reddeppa N.; and Lloyd, Albert H., Jr., 4,598,173, Cl. 179-18.0FA.

Pottier, Alain P., to Schlumberger Technology Corporation. Method and apparatus for displacing logging tools in deviated wells. 4,597,440, Cl. 166-250.000.

Pouyet, Patrice: *See—*
Mignot, Jacques; and Pouyet, Patrice, 4,598,419, Cl. 382-6.000.

PPG Industries, Inc.: *See—*
Prucnal, Paul J., 4,598,131, Cl. 525-440.000.
Reese, Thomas J., 4,597,789, Cl. 65-106.000.

Predina, Joseph P.; and Roberts, Tim H., to ITT Corporation. High speed phase/frequency detector. 4,598,217, Cl. 307-525.000.

Preiner, Gerhard: *See—*
Hockemeyer, Friedrich; and Preiner, Gerhard, 4,597,987, Cl. 427-54.100.

Preston, Joseph R.: *See—*
Schaer, Glenn R.; and Preston, Joseph R., 4,597,836, Cl. 204-4.000.

Price, Gordon L.; Ruddick, Howard G.; and Cook, Henry R., to West Point Foundry and Machine Co. Thread tension monitoring and clamping apparatus. 4,598,184, Cl. 200-61.180.

Prince Industrial Development Co., Ltd.: *See—*
Yoshinaga, Sadao, 4,597,732, Cl. 431-255.000.

Processing Research Association of Residual Oil: *See—*
Yoshioka, Susumu; Matsuo, Nobuo; Meguri, Nobuyasu; Murakami, Tadashi; Ishibashi, Yasushi; Matsuda, Kenichi; Suzuka, Teruo; Fukase, Satoshi; and Ohse, Hidetaka, 4,597,856, Cl. 208-112.000.

Procter & Gamble Company, The: *See—*
Buell, Kenneth B., 4,597,760, Cl. 604-397.000.
Buell, Kenneth B., 4,597,761, Cl. 604-397.000.
Forand, Joseph T.; and Hellyer, James A., 4,597,770, Cl. 44-51.000.

Proctor & Gamble Company, The: *See—*
Vander Meer, James M., 4,597,898, Cl. 252-529.000.

Proizvodstvennoe Obiedinenie "Litbumprom": *See—*
Terentiev, Otto A.; Burov, Anatoly V.; Vorobieva, Ekaterina Y.; Grudinka, Ekaterina I.; Nesterchuk, Gennady T.; Shapovalov, Oleg I.; Usmanov, Khamdam U.; Mirkamilov, Shavkat M.; Mirkamilov, Tolkun M.; and Sharkov, Vladimir V., 4,597,928, Cl. 264-87.000.

PROT S.r.l.: *See—*
Sfondrini, Francesco; and Corelli, Giancarlo, 4,597,192, Cl. 34-66.000.

Prucnal, Paul J., to PPG Industries, Inc. Catalysts for curable coating vehicle based upon aminoalkyloxy silanes and organic isocyanates. 4,598,131, Cl. 525-440.000.

Pugsley, Peter C., to Crosfield Electronics Limited. Video retouching system. 4,598,282, Cl. 340-703.000.

Puliafito, Carmen A.: *See—*
Swaniger, James R.; Steinert, Roger F.; and Puliafito, Carmen A., 4,597,649, Cl. 351-214.000.

Purac Aktiebolag: *See—*
Andersson, Per-Erik; Annergren, Goran E.; Hoglund, Hans E.; and Peterson, Per V., 4,597,872, Cl. 210-605.000.

Pylon Company, Inc.: *See—*
Staples, Robert E.; Ierardi, Joseph A.; and Golder, Willis E., 4,598,246, Cl. 324-73.0PC.

QA Technology Company: *See—*
Coe, Thomas D., 4,597,622, Cl. 339-95.00R.

Quest, Thomas A. Angular cap for dressing and stabilizing office partitioning. 4,597,231, Cl. 52-239.000.

Quinn, Francis G.: *See—*
Reeser, Floyd H.; and Quinn, Francis G., 4,597,345, Cl. 114-20.00R.

Quintana, Manuel E.; and Estabrook, Lawrence E., to Texaco Development Corporation. Process for partial oxidation of hydrocarbonaceous fuel and recovery of water from dispersions of soot and water. 4,597,773, Cl. 48-197.00R.

Quintec Interconnect Systems: *See—*
Lax, Ronald G.; Johnson, Robert G.; Henningsen, Charles G.; and Ellis, J. Scott, 4,597,624, Cl. 339-143.00R.

R. J. Reynolds Tobacco Company: *See—*
Holt, Dewey L.; and Reynolds, Benjamin F., 4,597,396, Cl. 131-327.000.

Rabenau, Richard; and Kanner, Rowland W., to Ryder International Corporation. Vibrator actuated lens cleaning system. 4,597,399, Cl. 134-184.000.

Racca, Romulus, to Barry Wright Corporation. Adjustable torsion spring. 4,597,567, Cl. 267-140.200.

Rach, Heinz-Dieter: *See—*
Mauk, Gerhard; Huinink, Heinrich; Seitz, Hans; Frerichs, Udo; Rach, Heinz-Dieter; and Poque , Dionysius, 4,597,426, Cl. 152-379.500.

Rafferty, Michael F.: *See—*
Rice, Kenner C.; Rafferty, Michael F.; Jacobson, Arthur E.; Contreras, Patricia; O'Donohue, Thomas L.; Lessor, Ralph A.; and Mattson, Mariena V., 4,598,153, Cl. 546-229.000.

Raghavan, Vijaya G. S.; and Pannu, Kulbir, to McGill University. Method and apparatus for drying or heat treating granular material. 4,597,737, Cl. 432-197.000.

Raible, Donald A., to American Hospital Supply Corp. Angular implant device. 4,597,756, Cl. 604-175.000.

Raif, Joshua; and Zair, Eliezer, to Laser Industries Ltd. Endoscopic attachment to a surgical laser. 4,597,380, Cl. 128-6.000.

Ramser, Robert A.; Barch, Daniel R.; Buchovecky, Kalman E.; and Kuchera, Ray A., to Aluminum Company of America. Process for the production of particulate metal. 4,597,919, Cl. 264-12.000.

Ramunas, Valdas S., to Erickson Tool Company. Quick-connect mechanism. 4,597,699, Cl. 409-232.000.

Rana, Iftikhar A.: *See—*
Brill, Bernard A., III; Junker, Warren R.; White, John K.; Rana, Iftikhar A.; Bevilacqua, Bruce W.; Cooper, Frank W., Jr.; and Taszarek, Bruce J., 4,597,294, Cl. 73-623.000.

Randall, James C.; and Whitte, William M., to Phillips Petroleum Company. Polymer composition and preparation method. 4,598,128, Cl. 525-240.000.

Rank, Allen H., Jr. Method and apparatus for binding paper. 4,597,751, Cl. 493-403.000.

Raplee, Larry J.: *See—*
Karbassiyoon, Kamran; Akers, Francis I.; Raplee, Larry J.; and Fletcher, Daniel G., 4,597,785, Cl. 65-2.000.

Rasch, Heinz: *See—*
Heinemann, Otto; Baldus, Heinz-Dieter; Supp, Armin; Nanz, Hans; Thieme, Helmut; and Rasch, Heinz, 4,597,867, Cl. 210-218.000.

RCA Corporation: *See—*
Casey, Robert F., 4,598,309, Cl. 358-11.000.
Credelle, Thomas L., 4,598,227, Cl. 313-422.000.
Elabd, Hammam; and Kosonocky, Walter F., 4,598,321, Cl. 358-213.000.
Fairbanks, David W., 4,597,646, Cl. 350-529.000.
Goodman, Lawrence A.; Goodman, Alvin M.; and Gossenberger, Herman F., 4,598,249, Cl. 324-158.00R.
Hettiger, James, 4,598,423, Cl. 455-191.000.
Ipri, Alfred C., 4,597,160, Cl. 29-571.000.
Rogers, Robert L., III, 4,598,316, Cl. 358-168.000.
Tarzaiski, Richard J., 4,598,325, Cl. 360-39.000.
Yu, Ju M., 4,598,317, Cl. 358-192.100.

Read, Clifford D., to Northern Telecom Limited. Telephone set with two position mounting with alternate seating of handset. 4,598,175, Cl. 179-100.00C.

Reba, Imants; and Pollock, Rodney E., to Crown Zellerbach Corporation. System for handling discrete sheets. 4,597,573, Cl. 271-195.000.

Reczek, James A., to Eastman Kodak Company. Photographic products employing novel nondiffusible metal complexes of azo dyes. 4,598,030, Cl. 430-17.000.

Redding, Thomas P.; and Gray, H. William, to Xerox Corporation. Sheet feeder stack support. 4,597,571, Cl. 271-150.000.

Reed, Edward D., Jr.; and Benedict, George J., to GTE Communication Products Corporation. Laser apparatus with electro-optic Q-switch assembly. 4,598,405, Cl. 372-12.000.

Reese, Thomas J., to PPG Industries, Inc. Tungsten alloy bending mold inserts. 4,597,789, Cl. 65-106.000.

Reeser, Floyd H.; and Quinn, Francis G., to United States of America, Navy. Torpedo cableless umbilical. 4,597,345, Cl. 114-20.00R.

Reflective Technology, Inc.: *See—*
Rooney, Harry B., 4,597,682, Cl. 400-656.000.

Refractory Anchors, Inc.: *See—*
Brown, Eugene N., 4,597,702, Cl. 411-529.000.

Regie Nationale des Usines Renault: *See—*
Bascou, Jacques, 4,597,598, Cl. 292-68.000.

Rehkemper, Steven F.; and Disko, Harry, to Marvin Glass & Associates. Self-propelled toy. 4,597,744, Cl. 446-278.000.

Reich, Abraham: *See—*
Brandstetter, Robert W.; Lynn, Otto F.; Reich, Abraham; and Waido, Richard P., 4,597,630, Cl. 350-3.830.

Reichenberger, Arthur M. Security device. 4,597,273, Cl. 70-30.000.

Reif, Robert B., to Santek, Inc. Electro-inertial precipitator unit. 4,597,780, Cl. 55-119.000.

Reijnen, Piet: *See—*
Hennings, Detlev F. K.; Janssen, Rolf P.; and Reijnen, Piet, 4,598,055, Cl. 501-137.000.

Reimer, William A., to GTE Automatic Electric Inc. Stabilized array pin connector. 4,597,618, Cl. 339-65.000.

Reimer, William A., to GTE Communication Systems Corporation. Low insertion force connection arrangement. 4,597,619, Cl. 339-75.0MP.

Reimers, Ulrich, to Robert Bosch GmbH. Method and apparatus for converting a video signal to a corresponding signal of lower line count. 4,598,314, Cl. 358-140.000.

Reindel, Kenneth A.; and Mego, Thomas J., to Keithley Instruments, Inc. JFET ohmic differential amplifier. 4,598,253, Cl. 330-253.000.

Reinelt, Werner: *See—*
Krieger, Karl; Hartleb, Jochem; and Reinelt, Werner, 4,597,557, Cl. 251-63.400.

Remy, Francis: *See—*
Marhic, Gerard; and Remy, Francis, 4,598,191, Cl. 219-121.0PW.

Renholts, Roy J. Imprintable tape and method for imprinting same. 4,598,003, Cl. 428-40.000.

Research Corporation: *See—*
Deno, Norman S., 4,598,417, Cl. 381-67.000.
Newkome, George R., 4,598,073, Cl. 514-185.000.

Research One Limited Partnership: *See—*
Miller, Richard S.; Bright, Randall P.; Vargo, Richard D.; and Dreyfuss, Patricia M., 4,598,012, Cl. 428-228.000.

Resnick, Brian J.: *See—*
Holmes, John G.; Messina, Elena R.; Resnick, Brian J.; and Teach, Charles C., 4,598,380, Cl. 364-513.000.

Respitrace Corporation: *See—*
Sackner, Marvin A., 4,597,394, Cl. 128-777.000.

Retallick, William B. Catalytic converter for a diesel engine. 4,597,262, Cl. 60-274.000.

Retallick, William B. Spiral catalyst support and method of making it. 4,598,063, Cl. 502-439.000.

Reynolds, Benjamin F.: *See—*
Holt, Dewey L.; and Reynolds, Benjamin F., 4,597,396, Cl. 131-327.000.

Reynolds, Richard W.: *See—*
Glennon, Timothy F.; and Reynolds, Richard W., 4,598,223, Cl. 310-260.000.

Rheem Manufacturing Corporation: *See—*
Troughton, Thomas D., 4,597,502, Cl. 220-67.000.

Rheinmetall G.m.b.H.: *See—*
Bocker, Jurgen; and Wallow, Peter, 4,597,333, Cl. 102-518.000.

Rhodenizer, Harold L.: *See—*
Kukanskis, Peter E.; and Rhodenizer, Harold L., 4,597,988, Cl. 427-97.000.

Rice, Kenner C.; Rafferty, Michael F.; Jacobson, Arthur E.; Contreras, Patricia; O'Donohue, Thomas L.; Lessor, Ralph A.; and Mattson, Mariena V., to United States of America, Health and Human Services. Metaphit, a specific acylating agent for the [^{3}H] phencyclidine. 4,598,153, Cl. 546-229.000.

Rice, Quay D., Sr. Potted plant display stand. 4,597,550, Cl. 248-146.000.

Rice, Trudie C.: *See—*
Fischer, Frederick H.; Murphy, Edmond J.; and Rice, Trudie C., 4,598,039, Cl. 430-323.000.

Richman Brothers Company: *See—*
Burton, James O.; Adam, Timothy S.; Budziak, Frank W.; and Nekoloff, Michael W., 4,598,376, Cl. 364-470.000.

Richter Gedeon Vegyeszeti Gyar Rt: *See—*
Toth, Edit; Torley, Jozsef; Palosi, Eva; Szebereneyi, Szabolcs; Szporny, Laszlo ; Gorog, Sandor; and Hajdu, Istvan, 4,598,080, Cl. 514-277.000.

Richter, Thomas A. Arc lamp support system. 4,598,348, Cl. 362-390.000.

Ricoh Company, Ltd.: *See—*
Koike, Takahisa; Fukazawa, Takao; Ishima, Kazumi; Murai, Toshiharu; Itoh, Tadashi; Kato, Toshifumi; and Jinnai, Koichiro, 4,598,299, Cl. 346-75.000.
Nukaya, Yasuyuki, 4,597,572, Cl. 271-171.000.
Suzaki, Masayuki; Nishiwaki, Shoji; Hayashima, Toshitaka; Araki, Shigeyuki; and Momose, Masanori, 4,598,301, Cl. 346-76.0PH.

Rigo, Michel: *See—*
Loiseau, Gerard; Molozay, Maurice; and Rigo, Michel, 4,597,406, Cl. 137-113.000.
Rine, James C.: *See—*
Tloczynski, James J.; Budzol, Melvin; Ahola, Clifford J.; and Rine, James C., 4,597,536, Cl. 241-62.000.
Rinker, Douglas A.: *See—*
Shepler, John E.; Rinker, Douglas A.; Beneditz, Bruce D.; Vicari, John J.; and Faulkner, Dennis T., 4,598,355, Cl. 364-184.000.
Rinn, Jurgen. Gantry-type jig. 4,597,182, Cl. 33-1.00M.
Ripin, Barrett H.; and Whitlock, Robert R., to United States of America, Navy. Radiative opacity and emissivity measuring device. 4,597,933, Cl. 376-153.000.
Ritter, Gerhard: *See—*
Matz, Klaus; Ritter, Gerhard; Ritter, Klaus; and Pollhammer, Edgar, 4,597,239, Cl. 52-644.000.
Ritter, Klaus: *See—*
Matz, Klaus; Ritter, Gerhard; Ritter, Klaus; and Pollhammer, Edgar, 4,597,239, Cl. 52-644.000.
Robbins, Clyde N., to General Instrument Corporation. Video encryption system. 4,598,318, Cl. 358-124.000.
Robbins & Craig Welding & Mfg. Co.: *See—*
Bacon, Jeffery E.; Craig, James E.; and Pedersen, Mark K., 4,597,845, Cl. 204-206.000.
Roberson, Charles W.: *See—*
Mako, Frederick M.; Pasour, John A.; and Roberson, Charles W., 4,598,247, Cl. 324-77.00R.
Robert Bosch GmbH: *See—*
Buck, Rainer; Wessel, Wolf; and Stumpp, Gerhard, 4,597,265, Cl. 60-602.000.
Burkhardt, Joachim; Dreyer, Manfred; Klett, Dittmar; and Weyl, Helmut, 4,597,849, Cl. 204-424.000.
Hafner, Udo; and Knapp, Heinrich, 4,597,558, Cl. 251-129.150.
Reimers, Ulrich, 4,598,314, Cl. 358-140.000.
Stumpe, Werner, 4,597,610, Cl. 303-22.00R.
Roberts, Gilbert C.: *See—*
Baldauf, Lawrence M.; Girvan, Edward J.; Overfield, Richard B.; and Roberts, Gilbert C., 4,597,177, Cl. 29-878.000.
Roberts, Russell W.: *See—*
Gabelish, Peter W.; Vial, Albany R.; and Roberts, Russell W., 4,597,321, Cl. 91-470.000.
Roberts, Tim H.: *See—*
Predina, Joseph P.; and Roberts, Tim H., 4,598,217, Cl. 307-525.000.
Robeson, Lloyd M.; and Papuga, Donald M., to Union Carbide Corporation. Blends of a polyarylate and a poly(ester carbonate). 4,598,130, Cl. 525-439.000.
Roche, Joseph R.; Alexander, Gabriel G.; and Carbaugh, William L., to Hydril Company. Diverter/bop system and method for a bottom supported offshore drilling rig. 4,597,447, Cl. 166-347.000.
Rockwell International Corporation: *See—*
Bath, David E., 4,598,399, Cl. 370-55.000.
Ciechanowski, Mark; and Faraday, Robin C., 4,597,551, Cl. 248-314.000.
Hepworth, Mark N., 4,598,236, Cl. 315-403.000.
Shutt, Sidney G.; and Dorsman, Adrian K., 4,598,270, Cl. 340-347.0NT.
Ullman, Alan Z.; Silverman, Jacob; and Friedman, Joseph, 4,597,776, Cl. 48-197.00R.
Roeber, Artur: *See—*
Zeitler, Gerhard; Werner, Frank; Bittner, Gerhard; Baumann, Karl-Heinz; Roeber, Artur; Metzinger, Lothar; Ohlinger, Rainer; and Zettler, Hans D., 4,597,927, Cl. 264-85.000.
Roesner, Bruce B.; and Hays, William L. Reduced-area, read-only memory. 4,598,386, Cl. 365-105.000.
Rogers, Alfred N.; and Awerbuch, Leon, to Bechtel International Corporation. Gas separating-crystallizer. 4,597,950, Cl. 422-252.000.
Rogers, Howard G.; Gaudiana, Russell A.; McGowan, Cynthia B.; Norland, Kenneth S.; and Sahatjian, Ronald J., to Polaroid Corporation. Liquid crystal compositions and devices and novel compounds. 4,597,891, Cl. 252-299.100.
Rogers, Robert L., III, to RCA Corporation. Brightness control network in a video signal processor with AC coupled output stages. 4,598,316, Cl. 358-168.000.
Rohm GmbH Chemische Fabrik: *See—*
Schweikhart, Gertfried, 4,597,763, Cl. 623-8.000.
Rolf, Jeffrey O.: *See—*
Hicks, Bradford W.; Rolf, Jeffrey O.; and Valentine, Lewis J., 4,597,312, Cl. 74-695.000.
Roller, Hermann; Hack, Joachim; Woweries, Uwe; Lehner, August; Grau, Werner; Nagel, Peter; and Falk, Roland, to BASF Aktiengesellschaft. Preparation of magnetic recording media. 4,597,990, Cl. 427-130.000.
Rollins, William L. Means for critically damping a dynamic loudspeaker. 4,598,178, Cl. 179-115.5VC.
Roltra S.p.A.: *See—*
Brusasco, Enzo, 4,597,305, Cl. 74-424.80A.
Romag Holdings Ltd.: *See—*
Holmes, Alan, 4,598,274, Cl. 340-550.000.
Roncaglione, James W. Flexible vehicle washing brush and coupling therefor. 4,597,128, Cl. 15-53.0AB.
Rongoe, James, Jr. Girder system. 4,597,233, Cl. 52-334.000.
Roode, Hermanus B. Seedling tray. 4,597,222, Cl. 47-87.000.
Rooney, Harry B., to Reflective Technology, Inc. Impact print bar assembly. 4,597,682, Cl. 400-656.000.
Roorda, Herm J.; and Jipping, Max J., to Akzo nv. Composition of matter useful for agglomerating a metal-containing ore material. 4,597,797, Cl. 106-194.000.
Roos, William N.: *See—*
Goudy, Paul R., Jr.; Doolittle, William P.; Jenkins, Thomas E.; Beemster, Bernard J.; Roos, William N.; and Collins, Patrick V., 4,597,530, Cl. 239-452.000.
Root Spring Scraper Company: *See—*
Weeks, Warran D., 4,597,202, Cl. 37-232.000.
Rorabaugh, Barre L. Track-mounted support. 4,597,553, Cl. 248-440.000.
Rose, Leslie C.: *See—*
Ware, Charles H.; Rose, Leslie C.; and Allen, Joseph C., 4,597,441, Cl. 166-261.000.
Rosemount Inc.: *See—*
Cucci, Gerald R., 4,598,381, Cl. 364-558.000.
Wehrs, David L., 4,598,251, Cl. 328-140.000.
Rosenberg, Farel. Tow element bracket system for true straight wire orthodontics. 4,597,739, Cl. 433-16.000.
Rosenblum, Frank; and Labuc, Vladimir M., to Noranda Inc. Apparatus for metering and feeding a solution. 4,597,507, Cl. 222-16.000.
Ross, Clive; and Devoy, Ralph P., to Marc Industries Incorporated. Movement monitor. 4,598,275, Cl. 340-573.000.
Rossing, Barry R.; and Zymboly, Gregory E., to Westinghouse Electric Corp. High strength porous support tubes for high temperature solid electrolyte electrochemical cells. 4,598,028, Cl. 429-30.000.
Rostek, Paul M.: *See—*
Lauffer, Donald K.; Rostek, Paul M.; and Sani, Mehdi H., 4,598,216, Cl. 307-443.000.
Roth, Charles A.: *See—*
Ziemelis, Maris J.; and Roth, Charles A., 4,597,964, Cl. 424-70.000.
Rozmus, Walter J., to Kelsey-Hayes Company. Assembly for hot consolidating materials. 4,597,730, Cl. 425-78.000.
Ruaudel, Annie: *See—*
Barraud, Andre ; Leloup, Jean; and Ruaudel, Annie, 4,598,056, Cl. 502-4.000.
Ruddick, Howard G.: *See—*
Price, Gordon L.; Ruddick, Howard G.; and Cook, Henry R., 4,598,184, Cl. 200-61.180.
Ruderian, Max J. Heat and salve applicator. 4,597,757, Cl. 604-291.000.
Rudolf, Boris: *See—*
Gentischer, Josef; and Rudolf, Boris, 4,597,227, Cl. 51-168.000.
Ruesch Machine Company: *See—*
LeFrank, Robert J., 4,597,542, Cl. 242-64.000.
Ruffin, Paul B.: *See—*
Hunter, Joe S.; and Ruffin, Paul B., 4,597,255, Cl. 57-62.000.
Ruhrkohle Aktiengesellschaft: *See—*
Wolowski, Eckard; and Tamm, Hans-Friedrich, 4,597,851, Cl. 208-400.000.
Ruschke, Rick R.: *See—*
Aalto, William R.; and Ruschke, Rick R., 4,597,758, Cl. 604-256.000.
Rutgerswerke Aktiengesellschaft: *See—*
Lucke, Wolfgang; Beneke, Herbert; and Staglich, Peter, 4,598,138, Cl. 528-205.000.
Ruud, Jan. Powder spray with the ability to charge electrostatically. 4,597,534, Cl. 239-704.000.
Ruzicka, Jaromir; and Hansen, Elo H., to Bifok AB. Hydrodynamic sample introducing system. 4,597,298, Cl. 73-863.710.
Ryan, Desmond J.; and Bertignoll, Friedrich, to Northern Telecom Limited. Telephone handset cord guide and retainer. 4,598,176, Cl. 179-103.000.
Ryan, James M., to Falcon Jet Corporation. Aircraft mid-cabin divider. 4,597,549, Cl. 244-118.500.
Ryan, John O., to Ampex Corporation. Method and apparatus for eliminating lag in photoelectric tubes. 4,598,235, Cl. 315-370.000.
Ryder International Corporation: *See—*
Rabenau, Richard; and Kanner, Rowland W., 4,597,399, Cl. 134-184.000.
Rymal, Theodore R., Jr., to Dow, Robert, a part interest. Hydrocarbon recovery system. 4,597,863, Cl. 210-117.000.
S. C. Johnson & Son, Inc.: *See—*
Hansen, Frederick C.; and Kiehlbauch, Richard A., 4,598,118, Cl. 524-517.000.
Sackner, Marvin A., to Respitrace Corporation. Method for noninvasively monitoring mouth volume. 4,597,394, Cl. 128-777.000.
Sagawa, Masato: *See—*
Matsuura, Yutaka; Sagawa, Masato; and Fujimura, Setsuo, 4,597,938, Cl. 419-23.000.
Saglimbeni, Renato: *See—*
De Angelis, Giancarlo; Saglimbeni, Renato; and Mainardi, Riccardo, 4,598,371, Cl. 364-431.040.
Sahatjian, Ronald J.: *See—*
Rogers, Howard G.; Gaudiana, Russell A.; McGowan, Cynthia B.; Norland, Kenneth S.; and Sahatjian, Ronald J., 4,597,891, Cl. 252-299.100.
Saint, Jean-Paul: *See—*
Goudriaan, Frans; Hake, Timothy S.; Ladeur, Peter; Moureaux, Patrique; Saint, Jean-Paul; and van Dijk, Nicolaas, 4,598,059, Cl. 502-228.000.
Saito, Muneo: *See—*
Sugiyama, Kenkichi; Saito, Muneo; and Wada, Akio, 4,597,943, Cl. 422-70.000.
Saito, Toshiyuki; Okubo, Naofumi; Kaneko, Yoshiaki; and Tokumitsu, Yasuyuki, to Fujitsu Limited. Microwave power distributing and

synthesizing device and microwave power amplifying apparatus including the same. 4,598,254, Cl. 330-286.000.

Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, to Canon Kabushiki Kaisha. Photoconductive member with a-Si; a-(Si/Ge) and a-(Si/C) layers. 4,598,032, Cl. 430-58.000.

Sakai, Takami; and Inokuchi, Haruhisa, to Kabushiki Kaisha Toshiba. Power converter control apparatus and power converter control method. 4,598,350, Cl. 363-35.000.

Sakamoto, Akira: *See*—
Komatsubara, Michimasa; Fukami, Takeshi; Sakamoto, Akira; Sugita, Takehiro; and Miyata, Toshiya, 4,598,169, Cl. 178-22.040.

Sakamoto, Noboru: *See*—
Matsui, Seiji; Yatsunami, Kazuharu; Miyashita, Tsuneo; and Sakamoto, Noboru, 4,597,790, Cl. 75-3.000.

Sakamoto, Yoichi, to Matsushita Electric Industrial Co., Ltd. Television synchronous receiver. 4,598,319, Cl. 358-195.100.

Sakashita, Shigeru: *See*—
Ohwaki, Takayuki; Sakashita, Shigeru; Kawahara, Masahiro; Shinoda, Aishin; and Miyake, Yasuo, 4,598,070, Cl. 514-58.000.

Sakuda, Ryutaro: *See*—
Kurihara, Norigi; and Sakuda, Ryutaro, 4,597,932, Cl. 264-145.000.

Sakura Telecommunications, Inc.: *See*—
Clark, Lloyd E.; and Emery, Ralph E., 4,598,179, Cl. 179-84.00C.

Sakurai, Mikio; Yamauchi, Koki; and Suzuki, Shuji. Fuel spacer. 4,597,937, Cl. 376-441.000.

Sakurai, Yoshimi; Aoki, Takashi; and Nishikawa, Masao, to Honda Giken Kogyo K.K. Control device for a direct-coupling hydraulic clutch in a hydraulic torque converter. 4,597,482, Cl. 192-0.052.

Salen & Wikander AB: *See*—
Persbeck, Sven-Eric, 4,597,563, Cl. 266-77.000.

Sampson, Robert W.: *See*—
Kuchar, Paul J.; Sampson, Robert W.; and Pacanowski, Ronald F., 4,597,285, Cl. 73-29.000.

Samreth, Soth; Bellamy, Francois; and Chazan, Jean-Bernard, to Societe de Recheres Industrielles. Benzylphenyl osides, method of preparation and use therefor. 4,598,068, Cl. 514-25.000.

Samson, Wilfred J.; and Gandhi, Deepak R., to Advanced Cardiovascular Systems, Inc. Large bore catheter having flexible tip construction. 4,597,755, Cl. 604-96.000.

Sand, Michael L., to Hercules Incorporated. Method for impregnating a thermoplastic polymer. 4,598,006, Cl. 424-81.000.

Sanden Corporation: *See*—
Sato, Tadashi; and Terauchi, Kiyoshi, 4,597,724, Cl. 418-55.000.

Sander, Gunter; and Forster, Rolf, to Bernhard Forster GmbH. Orthodontic device. 4,597,738, Cl. 433-7.000.

Sandling, Michael J. Rotary valve operating mechanism. 4,597,556, Cl. 251-58.000.

Sandman, Daniel J., to GTE Laboratories Incorporated. Method for the preparation of aromatic selenium compounds. 4,597,914, Cl. 260-550.000.

Sands, Ned R. Toy water gun with a multiplicity of operation modes. 4,597,527, Cl. 239-394.000.

Sani, Mehdi H.: *See*—
Lauffer, Donald K.; Rostek, Paul M.; and Sani, Mehdi H., 4,598,216, Cl. 307-443.000.

Sanjurjo, Angel, to SRI International. Apparatus for obtaining silicon from fluosilicic acid. 4,597,948, Cl. 422-199.000.

Sano, Sadao: *See*—
Inoue, Kiyoshi; Onoue, Makoto; and Sano, Sadao, 4,598,189, Cl. 219-69.00W.

Sano, Shoichi; and Furukawa, Yoshimi, to Honda Giken Kogyo Kabushiki Kaisha. Steering system for vehicles. 4,597,462, Cl. 180-140.000.

Santefort, Richard A., to Valco Cincinnati, Inc. Double acting diaphragm pump with improved disassembly means. 4,597,721, Cl. 417-393.000.

Santek, Inc.: *See*—
Reif, Robert B., 4,597,780, Cl. 55-119.000.

Sanyo Electric Co., Ltd.: *See*—
Awane, Misao; Hara, Seiji; and Kobayashi, Satoshi, 4,598,379, Cl. 364-479.000.

Sartorius GmbH: *See*—
Knothe, Erich; Melcher, Franz-Josef; and Oldendorf, Christian, 4,597,458, Cl. 177-164.000.

Sasaki, Mitsuru; and Oguri, Yukio, to Sumitomo Chemical Company, Limited. α-Hydroxy-β-haloethylphosphinic acids and their salts, and their production and use. 4,598,092, Cl. 514-492.000.

Sasaya, Hideaki: *See*—
Nakano, Hiromichi; Sasaya, Hideaki; and Inagaki, Mitsuo, 4,597,718, Cl. 417-300.000.

Sato, Hideo: *See*—
Kawamura, Kouichi; Horie, Seiji; Makino, Naonori; and Sato, Hideo, 4,598,033, Cl. 430-75.000.

Sato, Masaki: *See*—
Shinada, Kazuyoshi; and Sato, Masaki, 4,597,824, Cl. 156-643.000.

Sato, Morio; and Igawa, Tatsuya, to Pilot Man-Nen-Hitsu Kabushiki Kaisha. Stencil, stencil material kit and stencil duplicator kit containing the same. 4,597,829, Cl. 156-644.000.

Sato, Tadashi; and Terauchi, Kiyoshi, to Sanden Corporation. Scroll type fluid displacement apparatus with centrifugal force balance-weight. 4,597,724, Cl. 418-55.000.

Sato, Tai, to Tokyo Shibaura Denki Kabushiki Kaisha. Multiplying circuit. 4,598,382, Cl. 364-757.000.

Sato, Takuo: *See*—
Fujii, Setsuro; Sato, Takuo; Kawamura, Hiroyuki; Yaegashi, Takashi; Kurumi, Masateru; and Aoyama, Takuo, 4,598,077, Cl. 514-233.000.

Sato, Yasuaki: *See*—
Ikegami, Yoshiki; and Sato, Yasuaki, 4,598,284, Cl. 340-750.000.

Satzinger, Gerhard: *See*—
Barth, Hubert; Fritschi, Edgar; Ganser, Volker; Hartenstein, Johannes; Herrmann, Manfred; and Satzinger, Gerhard, 4,598,076, Cl. 514-230.000.

Sawai, Hideki: *See*—
Takagi, Hirofumi; Kunugita, Kiyohiko; Sawai, Hideki; and Kariyone, Kazuo, 4,598,066, Cl. 514-18.000.

Sawicki, John E.: *See*—
Carr, Richard V. C.; Sawicki, John E.; and Toseland, Bernard A., 4,597,875, Cl. 210-710.000.

Scales, Frank J. Automotive air conditioning system flushing apparatus. 4,597,416, Cl. 137-899.400.

Scapple, Robert Y.; Peters, John W.; Linder, Jacques F.; and Yee, Edward M., to Hughes Aircraft Company. Method for photochemical vapor deposition. 4,597,986, Cl. 427-53.100.

Scarano, Robert V., to Albany International Corp. Electro-mechanical shower oscillator for papermaking machine. 4,598,238, Cl. 318-282.000.

Scepter Manufacturing Co. Ltd.: *See*—
Lates, Kornel, 4,597,503, Cl. 220-83.000.

Schaefer, George F.: *See*—
Forster, Denis; Schaefer, George F.; and Barker, George E., 4,598,162, Cl. 568-448.000.

Schaer, Glenn R.; and Preston, Joseph R., to Battelle Development Corporation. Method for high-speed production of metal-clad articles. 4,597,836, Cl. 204-4.000.

Schafer, Rolf: *See*—
Bayer, Thomas; Hinkel, Holger; Kleischmann, Kurt; Kuenzel, Ulrich; and Schafer, Rolf, 4,598,017, Cl. 428-336.000.

Schagen, Pieter, to U.S. Philips Corporation. Color display tube and device having such a tube. 4,598,233, Cl. 315-366.000.

Schaleger, Larry L.: *See*—
Ergun, Sabri; Schaleger, Larry L.; Wrathall, James A.; and Yaghoubzadeh, Nasser, 4,597,832, Cl. 162-234.000.

Scharf, Helmut, to Chemische Werke Huls Aktiengesellschaft. Method for the manufacture of pyromellitic acid dianhydride. 4,598,157, Cl. 549-239.000.

Schechtman, Melvin A.; and Cieslak, Ronald H., to Motorola, Inc. Wide common mode range analog CMOS voltage comparator. 4,598,215, Cl. 307-355.000.

Scheeler, Fred; and Eisendrath, David C., to Colborne Manufacturing Company. Automatic stacker. 4,597,705, Cl. 414-30.000.

Scheevel, Mark R.: *See*—
Logsdon, Gary L.; Scheevel, Mark R.; and Williams, Frank A., Jr., 4,598,361, Cl. 364-200.000.

Scheibe, Paul: *See*—
McCaffrey, Hugh; Scheibe, Paul; and Spear, Bruce A., 4,597,339, Cl. 108-51.100.

Scherer, Gunther: *See*—
Killer, Eric; and Scherer, Gunther, 4,597,846, Cl. 204-290.00F.

Schering Aktiengesellschaft: *See*—
Schweikert, Hans-Udo; Tunn, Ulf; Senge, Theodor; and Numann, Friedmund, 4,598,072, Cl. 514-170.000.
Skotsch, Carlo; Joppien, Hartmut; and Pieroh, Ernst A., 4,598,083, Cl. 514-357.000.

Schering Corporation: *See*—
Waitz, Jay A.; Patel, Mahesh G.; Marquez, Joseph A.; Kalyanpur, Manohar G.; and Horan, Ann C., 4,597,968, Cl. 424-118.000.

Schiemann, Wolfram. Pourer pipe. 4,597,513, Cl. 222-478.000.

Schildbach, Peter: *See*—
Cardullo, Mario; Caraluzzi, Mark; and Schildbach, Peter, 4,597,325, Cl. 99-404.000.

Schilling, Peter, to Westvaco Corporation. Cationic bituminous emulsions and emulsion aggregate slurries. 4,597,799, Cl. 106-277.000.

Schindl, Klaus P., to C. Reichert Optische Werke AG. Inclinable microscope body. 4,597,644, Cl. 350-511.000.

Schindler, Ursula: *See*—
Beyerle, Rudi; Bender, Heinz; Schindler, Ursula; Nitz, Rolf-Eberhard; and Martorana, Piero A., 4,598,079, Cl. 514-252.000.

Schlumberger Technology Corporation: *See*—
Bourdet, Dominique; and Whittle, Timothy, 4,597,290, Cl. 73-155.000.
Devaney, Anthony J., 4,598,366, Cl. 364-400.000.
Meek, Dale E., 4,597,439, Cl. 166-163.000.
Pottier, Alain P., 4,597,440, Cl. 166-250.000.

Schmelzer Corporation: *See*—
Johnson, LeRoy B., 4,597,414, Cl. 137-625.250.

Schmid, Hermann: *See*—
Bolinder, Boo; and Schmid, Hermann, 4,597,994, Cl. 427-213.000.

Schmid & Wezel: *See*—
Elmer, Stefan; and Forberger, Erich, 4,597,132, Cl. 17-23.000.

Schmid, Wolfgang: *See*—
Hentschel, Christian; and Schmid, Wolfgang, 4,598,199, Cl. 250-222.100.

Schneid, Josef; and Steidele, Andreas, to Sulzer-Escher Wyss AG. Calender. 4,597,275, Cl. 72-21.000.

Schneider, Michael; Kochloefl, Karel; and Bock, Ortwin, to Sud-Chemie Aktiengesellschaft. Catalyst for the synthesis of methanol and alcohol mixtures containing higher alcohols and method of making the catalyst. 4,598,061, Cl. 502-303.000.

Schneider, Michael; Pohl, Joachim; Kochloefl, Karel; and Bock, Ortwin, to Sud-Chemie Aktiengesellschaft. Iron oxide-chromium oxide catalyst and process for high temperature water-gas shift reaction. 4,598,062, Cl. 502-306.000.

Schnurbusch, Horst: *See*—
Disteldorf, Josef; Haage, Hans-Jurgen; and Schnurbusch, Horst, 4,598,121, Cl. 524-874.000.
Schoeffler, William N. Controllable downhole directional drilling tool and method. 4,597,454, Cl. 175-61.000.
Schoenmakers, Wijnand J.: *See*—
Kessels, Jozef L. W.; Schoenmakers, Wijnand J.; and Vrielink, Hendrik, 4,598,385, Cl. 364-900.000.
Schoenthal, Galeon W.; and Slaugh, Lynn H., to Shell Oil Company. Process for the preparation of wide pore catalysts. 4,598,060, Cl. 502-263.000.
Schoenthaler, David; and Wojcik, Thaddeus, to AT&T Technologies, Inc. Techniques for multipoint dispensing of viscous material. 4,597,420, Cl. 141-2.000.
Schonenberger, Helmut; Wappes, Beate; Jennerwein, Margaretha; von Angerer, Erwin; and Engel, Jurgen, to Degussa Aktiengesellschaft. (1,2-diphenyl)-ethylenediamine)-platinum (II) complex compounds. 4,598,091, Cl. 514-492.000.
Schotzau, Hans-Jorg; Coccioni, Renzo; and Sturzenegger, Christian, to Sprecher & Schuh AG. Gas-blast switch. 4,598,188, Cl. 200-148.00A.
Schroeder, Albert H.: *See*—
Denisevich, Peter, Jr.; Schroeder, Albert H.; Kurkov, Victor P.; and Suzuki, Shigeto, 4,597,896, Cl. 252-500.000.
Schroer, Walter: *See*—
Thoma, Wilhelm; Langel, Rolf; and Schroer, Walter, 4,598,120, Cl. 524-591.000.
Schuster, Ernst; and Knizia, Klaus, to L. & C. Steinmuller GmbH. Plant for preparing and hydrolyzing fossil fuels to prepare products low in sulfur content, and employment of these products for a combined generation of the electric current and gas. 4,597,257, Cl. 60-39.120.
Schuster, Richard L., to Manville Service Corporation. Carrier lock. 4,597,523, Cl. 229-40.000.
Schwartz, Bertram: *See*—
Capasso, Federico; Focht, Marlin W.; Macrander, Albert T.; and Schwartz, Bertram, 4,597,165, Cl. 29-576.00B.
Schwartz, Boris. Biased-tensioned auxiliary outsole member for shoes. 4,597,194, Cl. 36-7.10R.
Schwarz, Robert A., to Sundstrand Corporation. Positive engagement torque sensor. 4,597,480, Cl. 192-54.000.
Schwarz, Rudolf, to Staeubli Ltd. Lifting unit for a rotational dobby. 4,597,417, Cl. 139-76.000.
Schwarz, Wolfgang: *See*—
Merger, Franz; and Schwarz, Wolfgang, 4,597,907, Cl. 260-404.000.
Schweikert, Hans-Udo; Tunn, Ulf; Senge, Theodor; and Numann, Friedmund, to Schering Aktiengesellschaft. Combinations of an aromatase-inhibitor and an antiandrogen for prophylaxis and/or treatment of benign prostatic hyperplasia. 4,598,072, Cl. 514-170.000.
Schweikhart, Gertfried, to Rohm GmbH Chemische Fabrik. Implantable molded plastic part. 4,597,763, Cl. 623-8.000.
Schweitzer, David W. Ornamental attachment for footwear and the like. 4,597,198, Cl. 36-100.000.
Scott, Michael K.: *See*—
Coscia, Charles M.; and Scott, Michael K., 4,597,274, Cl. 70-455.000.
Scrivner, Jerry G., to Flex-o-lators, Inc. Spring deck for upholstered seating. 4,597,566, Cl. 267-91.000.
Scully, John W., to Pneumatic Scale Corporation. Electric eye for bagging machine. 4,597,240, Cl. 53-57.000.
Seagrave, Earl: *See*—
Bryan, Bynum O., Jr.; and Seagrave, Earl, 4,598,273, Cl. 340-539.000.
Sears, Roebuck, & Co.: *See*—
McGroarty, Joseph F.; and Houlihan, Thomas D., 4,598,177, Cl. 179-107.00E.
Seddon, Alan E.; and Littler, Joseph, to BICC Public Limited Company. Overhead electric traction systems. 4,598,180, Cl. 191-35.000.
Seely, Neil G.; and Harvey, Donald M., to Eastman Kodak Company. Roll film holders and multi-format camera. 4,597,653, Cl. 354-21.000.
Seely, Neil G.: *See*—
Harvey, Donald M.; and Seely, Neil G., 4,597,654, Cl. 354-21.000.
Seidler, Jack, to North American Specialties Corporation. Electrical connector. 4,597,625, Cl. 339-176.00M.
Seidler, Jack, to North American Specialties Corporation. Solder bearing clip. 4,597,628, Cl. 339-275.00T.
Seiko Epson Corporation: *See*—
Hoshikawa, Jun, 4,597,636, Cl. 350-334.000.
Seiko Instruments & Electronics Ltd.: *See*—
Kyogoku, Hideaki; and Tamura, Fujio, 4,597,288, Cl. 73-384.000.
Seitel, Steven C.; and Marrs, C. Denton, to United States of America, Navy. Dielectric air-interface plasma optical power limiter. 4,597,639, Cl. 350-363.000.
Seitz, Hans: *See*—
Mauk, Gerhard; Huinink, Heinrich; Seitz, Hans; Frerichs, Udo; Rach, Heinz-Dieter; and Poque , Dionysius, 4,597,426, Cl. 152-379.500.
Seki, Yukio: *See*—
Honjo, Toshio; and Seki, Yukio, 4,598,034, Cl. 430-106.600.
Sekiguchi, Kazuya: *See*—
Sugisawa, Ko; Sekiguchi, Kazuya; Tsuzi, Kiyoaki; and Ono, Akinobu, 4,597,945, Cl. 422-113.000.
Sekiguchi, Toshio: *See*—
Goto, Shigeru; and Sekiguchi, Toshio, 4,597,295, Cl. 73-861.170.
Sekmakas, Kazys; and Shah, Raj, to DeSoto, Inc. Production of epoxy phosphates. 4,598,109, Cl. 523-414.000.
Selby, Steve F., to GTE Communication Systems Corp. Laminate switch assembly having improved tactile feel and improved reliability of operation. 4,598,181, Cl. 200-5.00A.
Self, Colin H. Immunoassay with an increasing cyclic detection system. 4,598,042, Cl. 435-7.000.
Selignan, Olivier; Bourgain, Olivier; and Martin, Jean-Marie, to Chaussures Andre. Device for lifting, transferring and depositing objects. 4,597,490, Cl. 198-468.500.
Sember, Joseph A.; and Sember, Joseph A., III. Low pressure air supply and control system. 4,597,723, Cl. 417-440.000.
Sember, Joseph A., III: *See*—
Sember, Joseph A.; and Sember, Joseph A., III, 4,597,723, Cl. 417-440.000.
Semco Instruments, Inc.: *See*—
Moore, M. Samuel; and Paluka, Charles F., 4,597,259, Cl. 60-39.091.
Semiconductor Energy Laboratory Co., Ltd.: *See*—
Yamazaki, Shunpei, 4,597,161, Cl. 29-572.000.
Semmler, Hans-Joachim: *See*—
Ernst, Josef; and Semmler, Hans-Joachim, 4,597,796, Cl. 106-74.000.
Senge, Theodor: *See*—
Schweikert, Hans-Udo; Tunn, Ulf; Senge, Theodor; and Numann, Friedmund, 4,598,072, Cl. 514-170.000.
Sensui, Hideyuki; Suzuka, Susumu; Gonda, Michihiro; and Kikkawa, Katsumasa, to Hodogaya Chemical Co., Ltd. 6-tetrahydrofurfurylaminofluoran compound useful as a color former. 4,597,795, Cl. 106-21.000.
Sereda, Mykola. Rectifier commutation in electrical machines. 4,598,241, Cl. 318-439.000.
Sevigny, Roger, to United Technologies Corporation. Integrated circuit chip insertion and removal tool. 4,597,174, Cl. 29-741.000.
Sexton, Joe F., to Texas Instruments Incorporated. Low power shift register latch. 4,598,214, Cl. 307-291.000.
Seyler, Jay K.: *See*—
Orlowski, Ronald C.; and Seyler, Jay K., 4,597,900, Cl. 530-307.000.
Sfondrini, Francesco; and Corelli, Giancarlo, to PROT S.r.l. Tunnel-type apparatus for continuously sterilizing containers for the pharmaceutical industry. 4,597,192, Cl. 34-66.000.
Shaffer, Barry A.: *See*—
Clark, Larry L.; DeArdo, Carmen E.; and Shaffer, Barry A., 4,598,363, Cl. 364-200.000.
Shaffer, Frank E. Adjustable metering oil pump. 4,597,697, Cl. 408-61.000.
Shah, Dilip: *See*—
Berry, Ira R.; Shah, Dilip; and Borkan, Lionel, 4,597,885, Cl. 252-93.000.
Shah, Raj: *See*—
Sekmakas, Kazys; and Shah, Raj, 4,598,109, Cl. 523-414.000.
Shanklin, James R., Jr.; and Johnson, Christopher P., III, to A. H. Robins Company, Incorporated. N-(arylthioalkyl)-N'-(aminoalkyl-)ureas. 4,597,902, Cl. 262-239.00B.
Shapovalov, Oleg I.: *See*—
Terentiev, Otto A.; Burov, Anatoly V.; Vorobieva, Ekaterina Y.; Grudinka, Ekaterina I.; Nesterchuk, Gennady T.; Shapovalov, Oleg I.; Usmanov, Khamdam U.; Mirkamilov, Shavkat M.; Mirkamilov, Tolkun M.; and Sharkov, Vladimir V., 4,597,928, Cl. 264-87.000.
Sharkov, Vladimir V.: *See*—
Terentiev, Otto A.; Burov, Anatoly V.; Vorobieva, Ekaterina Y.; Grudinka, Ekaterina I.; Nesterchuk, Gennady T.; Shapovalov, Oleg I.; Usmanov, Khamdam U.; Mirkamilov, Shavkat M.; Mirkamilov, Tolkun M.; and Sharkov, Vladimir V., 4,597,928, Cl. 264-87.000.
Sharma, Shri C.; and Yang, Robert K., to Warner-Lambert Company. Chewing gum compositions containing novel sweetener delivery systems and method of preparation. 4,597,970, Cl. 426-5.000.
Sharp Kabushiki Kaisha: *See*—
Igarashi, Noboru, 4,597,374, Cl. 126-19.00R.
Yoshiura, Shoichiro; and Ikeda, Haruyoshi, 4,597,663, Cl. 355-14.00R.
Shaub, Melvin H.: *See*—
Ollinger, James C.; and Shaub, Melvin H., 4,598,010, Cl. 428-172.000.
Shaw, J. Howard: *See*—
Burrage, Lawrence M.; Shaw, J. Howard; Marek, James R.; and Anderson, David W., 4,598,265, Cl. 337-219.000.
Shaw, Jerry C.; and VanKessel, Theodore G., to International Business Machines Corp. Graphics display with improved window organization. 4,598,384, Cl. 364-900.000.
Shell Oil Company: *See*—
Diaz, Zaida, 4,597,779, Cl. 55-32.000.
Dilgren, Richard E.; Lau, Hon C.; and Hirasaki, George J., 4,597,442, Cl. 166-272.000.
Durbin, Daniel P., 4,597,922, Cl. 264-26.000.
Goudriaan, Frans; Hake, Timothy S.; Ladeur, Peter; Moureaux, Patrique; Saint, Jean-Paul; and van Dijk, Nicolaas, 4,598,059, Cl. 502-228.000.
McCausland, Dominick A. C.; Shirvill, Leslie C.; and Coles, Kenneth F., 4,597,734, Cl. 431-328.000.
Schoenthal, Galeon W.; and Slaugh, Lynn H., 4,598,060, Cl. 502-263.000.
Shepler, John E.; Rinker, Douglas A.; Beneditz, Bruce D.; Vicari, John J.; and Faulkner, Dennis T., to Sundstrand Corporation. Fault tolerant controller. 4,598,355, Cl. 364-184.000.

Sherman, James F., to General Motors Corporation. Compensated throttle valve. 4,597,313, Cl. 74-861.000.

Shibata, Hirochika: *See*—
Nishimura, Takumi; and Shibata, Hirochika, 4,597,611, Cl. 303-116.000.

Shibata, Hiroki: *See*—
Wada, Kiyoshi; Takeda, Hitoshi; Shibata, Hiroki; Toda, Atsushi; Yokoyama, Nobumi; and Yamada, Naohiro, 4,598,237, Cl. 318-16.000.

Shibazaki, Kenji: *See*—
Hirata, Sumiaki; Ito, Masazumi; and Shibazaki, Kenji, 4,597,662, Cl. 355-14.00R.

Shibazaki, Yaichiro: *See*—
Oka, Syotaro; Tahara, Shu; and Shibazaki, Yaichiro, 4,597,848, Cl. 204-418.000.

Shields, Charles E.; and Giese, Leonard R. Method for removing insulation from flat cable. 4,597,176, Cl. 29-829.000.

Shimadzu Corporation: *See*—
Oka, Syotaro; Tahara, Shu; and Shibazaki, Yaichiro, 4,597,848, Cl. 204-418.000.

Shimano Industrial Company Limited: *See*—
Nagano, Masashi, 4,597,474, Cl. 188-24.210.

Shimazu, Hideaki: *See*—
Yamakoshi, Ken-ichi; and Shimazu, Hideaki, 4,597,393, Cl. 128-677.000.

Shimizu, Shigeo: *See*—
Koyama, Hiroaki; and Shimizu, Shigeo, 4,598,110, Cl. 523-446.000.

Shimizu, Toshio: *See*—
Hobo, Sumiya; Shimizu, Toshio; and Nishida, Masaru, 4,597,431, Cl. 164-253.000.

Shimojima, Katuhiko: *See*—
Misaka, Takaaki; Furukawa, Takeshi; Onuma, Eiichi; Obana, Hiroshi; Fukuyama, Kyosuke; Tanaka, Toshiyuki; Murata, Hiroyuki; and Shimojima, Katuhiko, 4,597,537, Cl. 241-79.100.

Shin-Etsu Chemical Co., Ltd.: *See*—
Abe, Akira; and Terae, Nobuyuki, 4,597,894, Cl. 252-358.000.

Shinada, Kazuyoshi; and Sato, Masaki, to Kabushiki Kaisha Toshiba. Method of producing semiconductor device. 4,597,824, Cl. 156-643.000.

Shinada, Kazuyoshi: *See*—
Usami, Toshiro; Mikata, Yuuichi; and Shinada, Kazuyoshi, 4,597,159, Cl. 29-571.000.

Shinbori, Osamu: *See*—
Nakai, Tetsuya; Mimura, Yoshinori; Shinbori, Osamu; and Tokiwa, Hideharu, 4,597,786, Cl. 65-2.000.

Shinoda, Aishin: *See*—
Ohwaki, Takayuki; Sakashita, Shigeru; Kawahara, Masahiro; Shinoda, Aishin; and Miyake, Yasuo, 4,598,070, Cl. 514-58.000.

Shinozaki, Fumiaki: *See*—
Iwasaki, Masayuki; Maeda, Minoru; Shinozaki, Fumiaki; and Ishige, Sadao, 4,598,036, Cl. 430-270.000.

Shiojima, Kazuo, to Trio Kabushiki Kaisha. Variable intermediate bandwidth AM receiver. 4,598,426, Cl. 455-266.000.

Shirai, Hiroshi; and Matsuhisa, Tsuneyasu, to Fuji Photo Film Co., Ltd. Electrostatic spraying apparatus. 4,597,533, Cl. 239-701.000.

Shiraishi, Daiichi; Iwasaki, Eiji; and Fukumoto, Ryoichi, to Toyota Jidosha Kabushiki Kaisha; and Aisin Seiki Co., Ltd. Door window regulator. 4,597,223, Cl. 49-352.000.

Shirouzu, Shunji: *See*—
Naruse, Yujiro; and Shirouzu, Shunji, 4,598,207, Cl. 250-484.100.

Shirvill, Leslie C.: *See*—
McCausland, Dominick A. C.; Shirvill, Leslie C.; and Coles, Kenneth F., 4,597,734, Cl. 431-328.000.

Shoji Kabushiki Kaisha: *See*—
Narita, Haruyoshi, 4,597,217, Cl. 43-125.000.

Shu, Winston R.; and Hartman, Kathy J., to Mobile Oil Corporation. Viscous oil recovery method. 4,597,443, Cl. 166-272.000.

Shutt, Sidney G.; and Dorsman, Adrian K., to Rockwell International Corporation. Precision integrating analog-to-digital converter system. 4,598,270, Cl. 340-347.0NT.

SI Handling Systems, Inc.: *See*—
Jacoby, Charles E., 4,597,334, Cl. 104-37.000.

Sicpa Holding S.A.: *See*—
Amon, Albert; and Weil, Roger M., 4,597,793, Cl. 106-21.000.

Siddall, George B., to Bateman Engineering (International) Limited. Gold recovery processes. 4,597,791, Cl. 75-118.00R.

Siemens Aktiengesellschaft: *See*—
Ahne, Hellmut, 4,598,038, Cl. 430-283.000.
Behn, Reinhard; and Solar, Josef, 4,598,335, Cl. 361-314.000.
Maas, Michael, 4,598,281, Cl. 340-664.000.
Muller, Gerhard; Hahn, Hans; and Tropschuh, Walter, 4,597,752, Cl. 493-410.000.
Wondra, Arthur; Weller, Gerhard; and Ulrich, Alfred, 4,597,627, Cl. 339-196.00M.

Siemens Corporate Research & Support, Inc.: *See*—
Southard, Gary D., 4,598,257, Cl. 331-2.000.
Whelan, Michael, 4,598,401, Cl. 371-25.000.

Signode Corporation: *See*—
Wagdy, Mohamed K., 4,597,517, Cl. 227-8.000.

Silverman, Jacob: *See*—
Ullman, Alan Z.; Silverman, Jacob; and Friedman, Joseph, 4,597,776, Cl. 48-197.00R.

Simpson, Harold G., to Harold Simpson, Inc. Standing seam roof assembly. 4,597,234, Cl. 52-478.000.

Sims, Carl W.: *See*—
Zelinka, Richard J.; Itakura, Keiichi; Sims, Carl W.; and Kaplan, Bruce E., 4,598,049, Cl. 435-287.000.

Sinclair, A. Richard: *See*—
Graham, John W.; and Sinclair, A. Richard, 4,597,991, Cl. 427-214.000.

Singer, Mark. Support structures for chairs and the like having pivoting members. 4,597,604, Cl. 297-18.000.

Singh, Anand P.; and Knoedler, Norman R., to NRM Corporation. Tire curing press and loader. 4,597,729, Cl. 425-38.000.

Sinn, Brian T.: *See*—
Garcia-Mallol, Juan A.; and Sinn, Brian T., 4,597,774, Cl. 48-197.00R.

Siver, Chester A., to Conval, Inc. Half-turn valve. 4,597,560, Cl. 251-163.000.

Skarendahl, Ake: *See*—
Alexanderson, Johan; and Skarendahl, Ake, 4,597,802, Cl. 106-315.000.

Skerlos, Peter C.; and Strammello, Peter, Jr., to Zenith Electronics Corporation. All-channel television tuning system. 4,598,425, Cl. 455-180.000.

SKF GmbH: *See*—
Muller, Heinrich, 4,597,582, Cl. 277-53.000.

Skotsch, Carlo; Joppien, Hartmut; and Pieroh, Ernst A., to Schering Aktiengesellschaft. Alkylthiocinnamic acid nitriles for the control of harmful organisms. 4,598,083, Cl. 514-357.000.

Slaugh, Lynn H.: *See*—
Schoenthal, Galeon W.; and Slaugh, Lynn H., 4,598,060, Cl. 502-263.000.

Slavens, Clyde M. Track for welding carriage and locator apparatus therefor. 4,597,335, Cl. 104-118.000.

Small, James R.: *See*—
Smith, Walter A.; Small, James R.; and Ward, Ronald D., Jr., 4,598,410, Cl. 375-3.000.

Smilow, George; and Kayen, Samuel L. Identification tag. 4,597,207, Cl. 40-20.00R.

Smith, Earl D., to Dallas Smith Engineering Corporation. Trailer apparatus for transporting vehicles and other cargo. 4,597,712, Cl. 414-549.000.

Smith, Edward F., III: *See*—
Haque, Reza; Smith, Edward F., III; and Kadija, Igor V., 4,598,022, Cl. 428-413.000.

Smith, Glendon C., to Badische Corporation. Tension measurement device. 4,597,297, Cl. 73-862.480.

Smith, Graham: *See*—
O'Brien, Dennis; and Smith, Graham, 4,597,749, Cl. 493-226.000.

Smith International, Inc.: *See*—
Baugh, Benton F., 4,597,448, Cl. 166-348.000.

Smith, James E.: *See*—
Weis, Philip J.; Cook, Richard; Kaminski, David C.; and Smith, James E., 4,597,301, Cl. 74-15.860.

Smith, James L., to LTV Aerospace and Defense Co. Erasable optical read/write data storage system. 4,598,395, Cl. 369-100.000.

Smith, James R., Sr.; and Smith, Martha J., to Johnson, Joe W. Undergarment. 4,597,110, Cl. 2-408.000.

Smith, Jerry H.: *See*—
Stephen, John F.; Smith, Jerry H.; and Meshreki, Makram H., 4,598,113, Cl. 524-291.000.

Smith, Martha J.: *See*—
Smith, James R., Sr.; and Smith, Martha J., 4,597,110, Cl. 2-408.000.

Smith, Peter W.: *See*—
Chemla, Daniel S.; Miller, David A. B.; and Smith, Peter W., 4,597,638, Cl. 350-354.000.

Smith, Richard C., to Fichtel & Sachs Industries, Inc. Temperature compensated gas spring mechanism. 4,597,565, Cl. 267-64.130.

Smith, Ronald M.: *See*—
Gum, Peter H.; Levin, Arthur L.; Smith, Ronald M.; and Wilson, John H., 4,598,364, Cl. 364-300.000.

Smith, Trevor S., to Lucas Industries public limited company. Fuel control system for a gas turbine engine. 4,597,407, Cl. 137-115.000.

Smith, Walter A.; Small, James R.; and Ward, Ronald D., Jr., to NCR Corporation. Bidirectional repeater apparatus. 4,598,410, Cl. 375-3.000.

Smith, William F. Solar energy collector and glazing system. 4,597,378, Cl. 126-450.000.

SmithKline Beckman Corporation: *See*—
Yim, Nelson C., 4,597,901, Cl. 530-328.000.

Smiths Industries Public Limited Company: *See*—
Beardmore, Geoffrey; and Neville, Antony, 4,597,300, Cl. 74-5.00R.

Smolinsky, Gerald: *See*—
Chandross, Edwin A.; Dean, Robert E.; and Smolinsky, Gerald, 4,597,985, Cl. 427-39.000.

Smucker, Lee A.: *See*—
Kropf, Walter K., 4,597,219, Cl. 47-1.500.

Snap-Tite, Inc.: *See*—
Buseth, Richard A., 4,597,413, Cl. 137-614.040.

Snook, Matthew L.: *See*—
Groves, William A.; Snook, Matthew L.; and Browen, Rodney, 4,598,245, Cl. 324-73.00R.

Snow, William E.; and Warren, Thomas R., to American Cast Iron Pipe Company. High speed pipe lining method and apparatus. 4,597,995, Cl. 427-231.000.

Societe Anonyme Dite: SACILOR: *See*—
Deroche, Raymond-Yves; Bourdon, Yves; and Faessel, Andre , 4,597,283, Cl. 72-378.000.

Societe de Recheres Industrielles: *See—*
Samreth, Soth; Bellamy, Francois; and Chazan, Jean-Bernard, 4,598,068, Cl. 514-25.000.

Societe d'Optique, Precision Electronique et Mechanique (SOPELEM): *See—*
Mignot, Jacques; and Pouyet, Patrice, 4,598,419, Cl. 382-6.000.

Soderlund, Frits; and Karlsson, Kurt, to Svenska Rotor Maskiner Aktiebolag. Screw compressor having two individually displaceable regulating slides. 4,597,726, Cl. 418-201.000.

Sogah, Dotsevi Y.: *See—*
Farnham, William B.; Middleton, William J.; and Sogah, Dotsevi Y., 4,598,161, Cl. 564-101.000.

Sohio Alternate Energy Development Co.: *See—*
Burgess, Lester E.; McGarry, Phillip E.; and Herman, David E., 4,597,858, Cl. 209-166.000.

Solar, Josef: *See—*
Behn, Reinhard; and Solar, Josef, 4,598,335, Cl. 361-314.000.

Solar-Kist Corporation: *See—*
Hamilton, Bonnie, 4,597,812, Cl. 156-63.000.

Solartron Electronics, Inc.: *See—*
Zaghi, Hooshmand; and Kodama, Roy K., 4,597,151, Cl. 29-421.00R.

Soma, Hiroshi: *See—*
Takagi, Kazunori; Soma, Hiroshi; Miyata, Yoshiaki; Motozawa, Yasuki; and Katou, Hitoshi, 4,597,470, Cl. 181-141.000.

Sony Corporation: *See—*
Fukuda, Shinichi, 4,598,267, Cl. 340-347.0DD.
Komatsubara, Michimasa; Fukami, Takeshi; Sakamoto, Akira; Sugita, Takehiro; and Miyata, Toshiya, 4,598,169, Cl. 178-22.040.
Odaka, Kentaro, 4,598,403, Cl. 371-39.000.
Osakabe, Yoshio; and Suzuki, Tadao, 4,598,287, Cl. 340-825.240.

Sorrell, Malcolm E., to Voltarc Tubes, Inc. U-lamp leg brace. 4,598,343, Cl. 362-216.000.

Southard, Gary D., to Siemens Corporate Research & Support, Inc. Clock pulse signal generator system. 4,598,257, Cl. 331-2.000.

Southco, Inc.: *See—*
Bisbing, Robert H., 4,597,599, Cl. 292-174.000.

Spanopoulos, George. Roller boom reefing and hoisting of a sail. 4,597,347, Cl. 114-106.000.

Spear, Bruce A.: *See—*
McCaffrey, Hugh; Scheibe, Paul; and Spear, Bruce A., 4,597,339, Cl. 108-51.100.

Specht, Donald F.: *See—*
Wang, Shih-Ping; Morgan, Russell H.; and Specht, Donald F., 4,598,369, Cl. 364-414.000.

Spector, Donald. Compact air purifier unit. 4,597,781, Cl. 55-126.000.

Sperry Corporation: *See—*
Bowden, Donald F., Jr., 4,597,249, Cl. 56-1.000.
Bowden, Donald F., Jr., 4,597,254, Cl. 56-341.000.
Campbell, Willis R.; and Merkey, John A., 4,597,248, Cl. 56-1.000.
Linde, Gilbert W.; Stauffer, Norman M.; and Brackbill, Warren H., 4,597,532, Cl. 239-675.000.
Swenson, Robert E.; Hanson, Merlin L.; and Kelson, Larry J., 4,598,357, Cl. 364-200.000.

Spiegel, Erwin: *See—*
Vogt, Hans; and Spiegel, Erwin, 4,598,008, Cl. 428-117.000.

Spiesman, Robert L., to Honeywell. Driver circuit. 4,598,212, Cl. 307-3.000.

Spilde, Rodney. Active ridge vent. 4,597,324, Cl. 98-42.160.

Spinosa, Dominic J.; and Knoll, Frank, to East/West Industries, Inc. Mobile maintenance stand and crane apparatus. 4,597,498, Cl. 212-189.000.

Sprague Electric Company: *See—*
Gontowski, Walter S., Jr., 4,598,259, Cl. 331-111.000.

Sprecher & Schuh AG: *See—*
Schotzau, Hans-Jorg; Coccioni, Renzo; and Sturzenegger, Christian, 4,598,188, Cl. 200-148.00A.
Suter, Heinz, 4,598,264, Cl. 335-161.000.

Square D Company: *See—*
Cook, James W.; and Evans, Tery J., 4,598,186, Cl. 200-144.00R.
Gardner, Jeffrey B.; Kuiper, Gerald J.; and Nelson, Richard A., 4,598,183, Cl. 200-50.00A.

SRI International: *See—*
Sanjurjo, Angel, 4,597,948, Cl. 422-199.000.

Stack, Paul D., Jr.: *See—*
Galloup, Clifford L.; and Stack, Paul D., Jr., 4,597,419, Cl. 140-124.000.

Staeubli Ltd.: *See—*
Schwarz, Rudolf, 4,597,417, Cl. 139-76.000.

Staglich, Peter: *See—*
Lucke, Wolfgang; Beneke, Herbert; and Staglich, Peter, 4,598,138, Cl. 528-205.000.

Standard Havens, Inc.: *See—*
Brennecke, James H.; and Mace, Robert E., 4,597,783, Cl. 55-378.000.

Standard Oil Company (Indiana): *See—*
Broding, Robert A., 4,597,183, Cl. 33-125.00W.

Standex International Corporation: *See—*
Chamberlin, Edward R., 4,597,169, Cl. 29-605.000.

Staninets, Vasily I.: *See—*
Efimov, Andrei S.; Melnik, Igor M.; Tkachuk, Jury V.; Tronko, Nikolai D.; Efimova, Elena K.; Obrosova, Irina G.; Gordienko, Vadim M.; Kaminsky, Leonid A.; Staninets, Vasily I.; Zborovsky, Jury L.; Mokhort, Nikolai A.; and Kirichek, Lora M., 4,598,081, Cl. 514-296.000.

Stanyard, Ray: *See—*
Kindler, Gerhard; and Stanyard, Ray, 4,598,354, Cl. 364-174.000.

Staples, Robert E.; Ierardi, Joseph A.; and Golder, Willis E., to Pylon Company, Inc. Printed circuit board tester having a flex and wiping action free vacuum actuated edge connector. 4,598,246, Cl. 324-73.0PC.

Stapp, Paul R., to Phillips Petroleum Company. Upgrading of residual oils using a selenium catalyst wherein sulfur and metallic impurities are reduced. 4,597,855, Cl. 208-61.000.

Stark, Anton W. Valve for sequential chemical operations. 4,597,412, Cl. 137-606.000.

Starr, Lionel: *See—*
Mulhollan, James S.; and Starr, Lionel, 4,597,390, Cl. 128-340.000.

Stasiak, Nicholas: *See—*
Stratta, Julius J.; and Stasiak, Nicholas, 4,597,801, Cl. 106-308.00Q.

Staub, Hans-Rudolf: *See—*
Egli, Rene ; and Staub, Hans-Rudolf, 4,597,526, Cl. 239-123.000.

Stauffer, Norman M.: *See—*
Linde, Gilbert W.; Stauffer, Norman M.; and Brackbill, Warren H., 4,597,532, Cl. 239-675.000.

Steenblik, Richard A., to Georgia Tech Research Institute. Stereoscopic process and apparatus. 4,597,634, Cl. 350-144.000.

Steger, Arthur, to Andersen & Associates, Inc. Storage system. 4,597,615, Cl. 312-201.000.

Steidele, Andreas: *See—*
Schneid, Josef; and Steidele, Andreas, 4,597,275, Cl. 72-21.000.

Stein Industrie: *See—*
Fontanille, Daniel, 4,597,535, Cl. 241-30.000.

Steinert, Roger F.: *See—*
Swaniger, James R.; Steinert, Roger F.; and Puliafito, Carmen A., 4,597,649, Cl. 351-214.000.

Stenzel, Gerhard: *See—*
Kaule, Wittich; and Stenzel, Gerhard, 4,598,205, Cl. 250-458.100.

Stephen, John F.; Smith, Jerry H.; and Meshreki, Makram H., to ICI Americas Inc. Hindered hydroxyphenylalkanoates of ethoxylated bisphenol A and stabilized compositions. 4,598,113, Cl. 524-291.000.

Sterling Drug Inc.: *See—*
Bailey, Denis M., 4,598,082, Cl. 514-352.000.

Stevens, Kent A.: *See—*
Adair, Brenda A.; and Stevens, Kent A., 4,597,221, Cl. 47-66.000.

Stickel, Robert, to Honeywell GmbH. Method for simulation of a visual field of view. 4,597,740, Cl. 434-20.000.

Stickel, Robert, to Honeywell. Apparatus for simulation of a field of view. 4,597,741, Cl. 434-27.000.

Stihl, Andreas: *See—*
Wissmann, Michael; and Nickel, Hans, 4,597,371, Cl. 123-495.000.

Stinton, David P.; Lackey, Walter J.; and Lauf, Robert J., to United States of America, Energy. Dispersion toughened ceramic composites and method for making same. 4,598,024, Cl. 428-448.000.

Stirco, Inc.: *See—*
Neier, Benjamin R.; and Stirling, Donald L., 4,597,672, Cl. 366-186.000.

Stirling, Donald L.: *See—*
Neier, Benjamin R.; and Stirling, Donald L., 4,597,672, Cl. 366-186.000.

Stockton, Thomas R., to Ford Motor Company. Four-wheel drive clutch mechanism. 4,597,467, Cl. 180-248.000.

Stodolka, Mark J., to Occidental Chemical Corporation. Process for cleaning vessels containing sulfur dichloride. 4,597,803, Cl. 134-10.000.

Stolz, Albert: *See—*
Mordau, Manfred; Burk, Gerhard; and Stolz, Albert, 4,597,323, Cl. 98-2.110.

Stone, Thomas W., to Universal Electric Company. End play and lubricating system for fractional horsepower electric motors. 4,598,220, Cl. 310-90.000.

Storekraft Manufacturing Co.: *See—*
Brackhahn, Virgil D.; and Cook, Gary W., 4,598,341, Cl. 362-125.000.

Stork PMT B.V.: *See—*
van de Nieuwelaar, J. A., 4,597,133, Cl. 17-24.000.

Strachan, Alan F.: *See—*
Yarbrough, Charles J.; Strachan, Alan F.; and Weisman, Joe, 4,598,288, Cl. 340-825.340.

Strammello, Peter, Jr.: *See—*
Skerlos, Peter C.; and Strammello, Peter, Jr., 4,598,425, Cl. 455-180.000.

Strand, Jerome E.: *See—*
Thill, Gary A.; and Strand, Jerome E., 4,597,754, Cl. 604-154.000.

Strasinger, David T., to United States Shoe Corporation, The. Personalized boot pullstrap. 4,597,197, Cl. 36-56.000.

Stratta, Julius J.; and Stasiak, Nicholas, to Union Carbide Corporation. Silane dispersing agent for magnetic media. 4,597,801, Cl. 106-308.00Q.

Strawn, Russel W.: *See—*
Duvvury, Charvaka; and Strawn, Russel W., 4,598,389, Cl. 365-208.000.

Strohriegl, Peter: *See—*
Heitz, Walter; and Strohriegl, Peter, 4,598,143, Cl. 528-336.000.

Strolin-Benedetti, Margherita; Guerret, Patrick G.; Langlois, Michel; and Dostert, Philippe L., to Delalande S.A. Optically active derivatives of N-arylated oxazolidine-2-one, the process for preparing same and their application in therapeutics. 4,598,084, Cl. 514-374.000.

Strommen, Sherwood V.: *See—*
Trickel, Neal E.; and Strommen, Sherwood V., 4,597,810, Cl. 149-15.000.

Stubbs, Peter, to Johnsen & Jorgensen (Plastics) Ltd. Tamper-resistant closures for containers. 4,597,500, Cl. 215-256.000.
Stumpe, Werner, to Robert Bosch GmbH. Load-dependent brake force governor. 4,597,610, Cl. 303-22.00R.
Stumpp, Gerhard: *See*—
Buck, Rainer; Wessel, Wolf; and Stumpp, Gerhard, 4,597,265, Cl. 60-602.000.
Sturzenegger, Christian: *See*—
Schotzau, Hans-Jorg; Coccioni, Renzo; and Sturzenegger, Christian, 4,598,188, Cl. 200-148.00A.
Stutznacker, Klaus, to Naehmaschinenfabrik Emil Stutznaecker GmbH & Co, KG. Method of operating a sewing machine, especially a multi-needle sewing machine, and an arrangement for performing the method. 4,597,344, Cl. 112-262.300.
Sud-Chemie Aktiengesellschaft: *See*—
Schneider, Michael; Kochloefl, Karel; and Bock, Ortwin, 4,598,061, Cl. 502-303.000.
Schneider, Michael; Pohl, Joachim; Kochloefl, Karel; and Bock, Ortwin, 4,598,062, Cl. 502-306.000.
Suda, Yasuo; Alyfuku, Kiyoshi; Sunouchi, Akio; and Suzuki, Nobuyuki, to Canon Kabushiki Kaisha. In-focus state display device for camera. 4,597,659, Cl. 354-409.000.
Sudo, Hajime, to Kabushiki Kaisha Toshiba. Electromagnetic bearing. 4,597,613, Cl. 308-10.000.
Suey, Paul V. Soaking pit cover. 4,597,341, Cl. 110-173.00A.
Sugano, Hiroshi: *See*—
Oine, Toyonari; Sugano, Hiroshi; Yamada, Yoshihisa; Yamaguchi, Totaro; and Ohshima, Satoshi, 4,598,075, Cl. 514-203.000.
Oine, Toyonari; Sugano, Hiroshi; Yamada, Yoshihisa; Yamaguchi, Totaro; and Ohshima, Satoshi, 4,598,154, Cl. 548-194.000.
Suganuma, Saburo: *See*—
Leng, Svay; Suganuma, Saburo; and Kataoka, Hiroyuki, 4,597,660, Cl. 355-3.0SH.
Sugisawa, Ko; Sekiguchi, Kazuya; Tsuzi, Kiyoaki; and Ono, Akinobu, to House Food Industrial Company Limited. Sterilization apparatus. 4,597,945, Cl. 422-113.000.
Sugita, Takehiro: *See*—
Komatsubara, Michimasa; Fukami, Takeshi; Sakamoto, Akira; Sugita, Takehiro; and Miyata, Toshiya, 4,598,169, Cl. 178-22.040.
Sugiura, Motonobu: *See*—
Yoshitsugu, Noritada; Sugiura, Motonobu; and Matsuzaki, Yutaka, 4,597,587, Cl. 280-807.000.
Sugiyama, Kenkichi; Saito, Muneo; and Wada, Akio, to Morinaga & Co., Ltd.; and Japan Spectroscopic Co., Ltd. Apparatus for analyzing solid sample with supercritical fluid. 4,597,943, Cl. 422-70.000.
Sugiyama, Masahiro: *See*—
Obata, Yoshiharu; Noji, Takashi; Sugiyama, Masahiro; and Kawamura, Shigeharu, 4,598,228, Cl. 313-475.000.
Sugiyama, Yoshikatu: *See*—
Takiguchi, Hiroshi; Sugiyama, Yoshikatu; and Hosoya, Ryoji, 4,597,484, Cl. 192-70.150.
Sulzer-Escher Wyss AG: *See*—
Schneid, Josef; and Steidele, Andreas, 4,597,275, Cl. 72-21.000.
Sumitomo Chemical Company, Limited: *See*—
Ishizumi, Kikuo; Antoku, Fujio; and Asami, Yukio, 4,598,078, Cl. 514-252.000.
Ohashi, Hiromu; Suzuka, Masakazu; Murata, Yukio; and Fujitsuka, Nobuyoshi, 4,597,670, Cl. 356-405.000.
Sasaki, Mitsuru; and Oguri, Yukio, 4,598,092, Cl. 514-492.000.
Sumitomo Electric Industries Ltd.: *See*—
Maeda, Jun; and Mori, Yoshikatsu, 4,597,696, Cl. 407-114.000.
Yamakawa, Akira; and Kamijo, Eiji, 4,598,053, Cl. 501-104.000.
Sumitomo Metal Industries, Ltd.: *See*—
Hamada, Masami; Tanaka, Kiyokazu; Kikuchi, Takeshi; Asai, Yasuhiro; Hayashi, Chihiro; and Ohtake, Fumio, 4,597,278, Cl. 72-187.000.
Sumitomo Special Metals Co., Ltd.: *See*—
Matsuura, Yutaka; Sagawa, Masato; and Fujimura, Setsuo, 4,597,938, Cl. 419-23.000.
Wada, Toshiaki; Furukawa, Mitsuhiko; Nagano, Mitsuyoshi; Miyahara, Michito; and Mori, Shigeki, 4,598,052, Cl. 501-87.000.
Sumner, Samuel, to First Amsterdam Corp. Adjustable base support apparatus for a waterbed or a similar article. 4,597,117, Cl. 5-181.000.
Sundstrand Corporation: *See*—
Aleem, Mohd A.; Lobsinger, James L.; and Wefel, Jerry D., 4,598,218, Cl. 310-42.000.
Fair, Donald G.; and Chetty, Pandipati R. K., 4,598,351, Cl. 363-49.000.
Glennon, Timothy F.; and Reynolds, Richard W., 4,598,223, Cl. 310-260.000.
Miller, Kent, 4,597,477, Cl. 192-8.00R.
Schwarz, Robert A., 4,597,480, Cl. 192-54.000.
Shepler, John E.; Rinker, Douglas A.; Beneditz, Bruce D.; Vicari, John J.; and Faulkner, Dennis T., 4,598,355, Cl. 364-184.000.
Sunouchi, Akio: *See*—
Suda, Yasuo; Alyfuku, Kiyoshi; Sunouchi, Akio; and Suzuki, Nobuyuki, 4,597,659, Cl. 354-409.000.
Supp, Armin: *See*—
Heinemann, Otto; Baldus, Heinz-Dieter; Supp, Armin; Nanz, Hans; Thieme, Helmut; and Rasch, Heinz, 4,597,867, Cl. 210-218.000.
Suter, Heinz, to Sprecher & Schuh AG. Locking mechanism for a mutual mechanical interlocking of two adjoining switch apparatuses. 4,598,264, Cl. 335-161.000.
Suzaki, Masayuki; Nishiwaki, Shoji; Hayashima, Toshitaka; Araki, Shigeyuki; and Momose, Masanori, to Ricoh Company, Ltd. Thermal printer. 4,598,301, Cl. 346-76.0PH.
Suzuka, Masakazu: *See*—
Ohashi, Hiromu; Suzuka, Masakazu; Murata, Yukio; and Fujitsuka, Nobuyoshi, 4,597,670, Cl. 356-405.000.
Suzuka, Susumu: *See*—
Sensui, Hideyuki; Suzuka, Susumu; Gonda, Michihiro; and Kikkawa, Katsumasa, 4,597,795, Cl. 106-21.000.
Suzuka, Teruo: *See*—
Yoshioka, Susumu; Matsuo, Nobuo; Meguri, Nobuyasu; Murakami, Tadashi; Ishibashi, Yasushi; Matsuda, Kenichi; Suzuka, Teruo; Fukase, Satoshi; and Ohse, Hidetaka, 4,597,856, Cl. 208-112.000.
Suzuki, Atsushi: *See*—
Umetani, Keiji; Suzuki, Atsushi; Nakagawa, Manabu; Yoshida, Minoru; Kawaguchi, Fumio; Yamada, Hiromichi; and Koike, Kouichi, 4,598,203, Cl. 250-366.000.
Suzuki, Kisaku. Food shaping apparatus. 4,597,731, Cl. 425-204.000.
Suzuki, Kiyoshi: *See*—
Itamoto, Shigeru; Suzuki, Kiyoshi; and Yasuda, Kenji, 4,597,569, Cl. 269-21.000.
Suzuki, Nobuyuki: *See*—
Suda, Yasuo; Alyfuku, Kiyoshi; Sunouchi, Akio; and Suzuki, Nobuyuki, 4,597,659, Cl. 354-409.000.
Suzuki, Shigeto: *See*—
Denisevich, Peter, Jr.; Schroeder, Albert H.; Kurkov, Victor P.; and Suzuki, Shigeto, 4,597,896, Cl. 252-500.000.
Suzuki, Shuji: *See*—
Sakurai, Mikio; Yamauchi, Koki; and Suzuki, Shuji, 4,597,937, Cl. 376-441.000.
Suzuki, Tadao: *See*—
Osakabe, Yoshio; and Suzuki, Tadao, 4,598,287, Cl. 340-825.240.
Suzuki, Takatoshi: *See*—
Tachikawa, Hideo; Suzuki, Takatoshi; Fujita, Hironori; and Arai, Tohru, 4,597,808, Cl. 148-20.300.
Suzuki, Yasumichi: *See*—
Honjo, Takeshi; Kitahara, Makoto; Suzuki, Yasumichi; and Takahata, Naomi, 4,598,323, Cl. 358-285.000.
Svendsen, Lars G., to Pentapharm AG. Method for quantitatively assaying blood coagulation factor XII in human plasma. 4,598,043, Cl. 435-13.000.
Svenska Rotor Maskiner Aktiebolag: *See*—
Soderlund, Frits; and Karlsson, Kurt, 4,597,726, Cl. 418-201.000.
Swaniger, James R.; Steinert, Roger F.; and Puliafito, Carmen A., to American Hospital Supply Corporation. Information display apparatus for ophthalmic slit lamps. 4,597,649, Cl. 351-214.000.
Swanson, Robert A. Hydraulic car wash brush. 4,597,127, Cl. 15-24.000.
Swayne, David S.: *See*—
Chino, John J.; Swayne, David S.; and Gilmour, Richard J., 4,597,173, Cl. 29-741.000.
Swenson, Robert E.; Hanson, Merlin L.; and Kelson, Larry J., to Sperry Corporation. Cache/disk subsystem with file number for recovery of cached data. 4,598,357, Cl. 364-200.000.
Swidler, Ron; and Ploeger, Dale, to Kyocera Corporation. Transfer type recording apparatus. 4,598,302, Cl. 346-76.0PH.
Sylvan, Richard: *See*—
Handler, Milton E.; Sylvan, Richard; and Baisch, Herbert, 4,597,122, Cl. 5-503.000.
Systec Inc.: *See*—
Zelinka, Richard J.; Itakura, Keiichi; Sims, Carl W.; and Kaplan, Bruce E., 4,598,049, Cl. 435-287.000.
Szal, John R. Method of manufacture of a felted fibrous product from a nonaqueous medium. 4,597,930, Cl. 264-115.000.
Szebereneyi, Szabolcs: *See*—
Toth, Edit; Torley, Jozsef; Palosi, Eva; Szebereneyi, Szabolcs; Szporny, Laszlo ; Gorog, Sandor; and Hajdu, Istvan, 4,598,080, Cl. 514-277.000.
Szechenyi, Kalman, to International Standard Electric Corporation. Circuit arrangement for frame and phase synchronization of a local sampling clock. 4,598,413, Cl. 375-116.000.
Szmuszkovicz, Jacob; McCall, John M.; Kaplan, Lester J.; and McMillan, Moses W., to Upjohn Company, The. 2-pyrrolyl-cycloalkylamide analgesics. 4,598,088, Cl. 514-429.000.
Szonntagh, Eugene L., to Honeywell Inc. Quasi-continuous sorption/-desorption analysis method and an apparatus utilizing the same. 4,597,778, Cl. 55-18.000.
Szporny, Laszlo : *See*—
Toth, Edit; Torley, Jozsef; Palosi, Eva; Szebereneyi, Szabolcs; Szporny, Laszlo ; Gorog, Sandor; and Hajdu, Istvan, 4,598,080, Cl. 514-277.000.
Tabushi, Iwao: *See*—
Kamata, Masami; Tabushi, Iwao; Morimoto, Saichi; Asaeda, Takashi; and Aoki, Yoshikazu, 4,597,798, Cl. 106-203.000.
Tachikawa, Hideo; Suzuki, Takatoshi; Fujita, Hironori; and Arai, Tohru, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Process for ion nitriding aluminum or aluminum alloys. 4,597,808, Cl. 148-20.300.
Tachikawa Research Institute: *See*—
Kamata, Masami; Tabushi, Iwao; Morimoto, Saichi; Asaeda, Takashi; and Aoki, Yoshikazu, 4,597,798, Cl. 106-203.000.
Tadros, Jehane, to Firan Corporation. Method of manufacturing printed circuit boards. 4,597,828, Cl. 156-643.000.
Tahara, Shu: *See*—
Oka, Syotaro; Tahara, Shu; and Shibazaki, Yaichiro, 4,597,848, Cl. 204-418.000.
Tahara, Tetsuya; Arita, Masafumi; and Kuroda, Tsuyoshi, to Yoshitomi Pharmaceutical Industries, Ltd. 4-amino-tetrahydro-2-naphthoic acid derivatives. 4,598,093, Cl. 514-538.000.

Taiho Kogyo Co.: *See*—
Hagiwara, Yoshiyuki; and Morishita, Teru, 4,597,677, Cl. 384-105.000.

Tait, William C., to Minnesota Mining and Manufacturing Company. Distributed capacitance LC resonant circuit. 4,598,276, Cl. 340-572.000.

Takagi, Hirofumi; Kunugita, Kiyohiko; Sawai, Hideki; and Kariyone, Kazuo, to Analytical Bio-Chemistry Laboratories Inc. Antimycoplasmal agent for animals and method of use for prevention and treatment of mycoplasmosis. 4,598,066, Cl. 514-18.000.

Takagi, Kazunori; Soma, Hiroshi; Miyata, Yoshiaki; Motozawa, Yasuki; and Katou, Hitoshi, to Pioneer Electronic Corporation; and Honda Giken Kogyo Kabushiki Kaisha. Car speaker system. 4,597,470, Cl. 181-141.000.

Takagi, Kazutoshi: *See*—
Yoshino, Hisakazu; and Takagi, Kazutoshi, 4,597,650, Cl. 351-214.000.

Takagi, Kiyoshi; Toda, Ichiro; Hamasaki, Yoshiharu; and Wakamiya, Yoshinori, to Mitsubishi Denki Kabushiki Kaisha; and Kawasaki Steel Corporation. Method of controlling the rolling efficiency in hot rolling. 4,598,377, Cl. 364-472.000.

Takagi, Nobuo; Konno, Masakazu; and Kobayashi, Takeo, to Mitsui Mining & Smelting Co., Ltd. Method of producing hydrated iron oxide. 4,597,958, Cl. 423-633.000.

Takagi, Toshinori: *See*—
Matsuda, Koji; Takagi, Toshinori; and Ishikawa, Junzo, 4,598,231, Cl. 315-111.810.

Takahashi, Sankichi: *See*—
Okouchi, Isao; Izumi, Kenkichi; Takahashi, Sankichi; Mukai, Yasuteru; and Tomida, Akira, 4,597,871, Cl. 210-456.000.

Takahasi, Toru; and Ueno, Sadayasu, to Hitachi, Ltd. Oxygen sensor. 4,597,850, Cl. 204-426.000.

Takahata, Naomi: *See*—
Honjo, Takeshi; Kitahara, Makoto; Suzuki, Yasumichi; and Takahata, Naomi, 4,598,323, Cl. 358-285.000.

Takanashi, Akihiro: *See*—
Terasawa, Tsuneo; Kuniyoshi, Shinji; Takanashi, Akihiro; Kurosaki, Toshiei; Kawamura, Yoshio; and Hosaka, Sumio, 4,597,669, Cl. 356-401.000.

Takasugi, Hisashi: *See*—
Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tsuji, Kiyoshi, 4,598,147, Cl. 544-238.000.

Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tsuji, Kiyoshi, to Fujisawa Pharmaceutical Co., Ltd. Cephem compounds and processes for preparation thereof. 4,598,147, Cl. 544-238.000.

Takeda, Hitoshi: *See*—
Wada, Kiyoshi; Takeda, Hitoshi; Shibata, Hiroki; Toda, Atsushi; Yokoyama, Nobumi; and Yamada, Naohiro, 4,598,237, Cl. 318-16.000.

Takeda, Yoshiki, to Toyota Jidosha Kabushiki Kaisha. Final speed-reduction gearing assembly in transmission unit. 4,597,311, Cl. 74-694.000.

Takezono, Masatsugu, to Teiemu Giken Kabushiki Kaisha. Amphibian vehicle. 4,597,353, Cl. 114-270.000.

Takiguchi, Hiroshi; Sugiyama, Yoshikatu; and Hosoya, Ryoji, to Kyowa Works Co., Ltd. Synchronizer ring in vehicle speed change gear. 4,597,484, Cl. 192-70.150.

Tally, David N. Collapsible liquid storage tank. 4,597,425, Cl. 150-55.000.

Tamiya, Yoichiro: *See*—
Morita, Koyo; Nomura, Keizo; Nishizuka, Hiroshi; Hoshi, Tai; Tamiya, Yoichiro; and Asakawa, Terushige, 4,598,197, Cl. 250-205.000.

Tamm, Hans-Friedrich: *See*—
Wolowski, Eckard; and Tamm, Hans-Friedrich, 4,597,851, Cl. 208-400.000.

Tamura, Fujio: *See*—
Kyogoku, Hideaki; and Tamura, Fujio, 4,597,288, Cl. 73-384.000.

Tamura, Keiichi: *See*—
Mori, Shinji; and Tamura, Keiichi, 4,597,543, Cl. 242-107.40B.

Tamura, Kunio; and Horiai, Takayuki, to Kirin Beer Kabushiki Kaisha. Bottle opening machine. 4,597,314, Cl. 81-3.200.

Tanabe, Kozo: *See*—
Otake, Noboru; Kawai, Hiroyuki; Hayakawa, Yoichi; Nakagawa, Masaya; Imamura, Kanji; and Tanabe, Kozo, 4,598,146, Cl. 536-6.400.

Tanabe Seiyaku Co., Ltd.: *See*—
Oine, Toyonari; Sugano, Hiroshi; Yamada, Yoshihisa; Yamaguchi, Totaro; and Ohshima, Satoshi, 4,598,075, Cl. 514-203.000.
Oine, Toyonari; Sugano, Hiroshi; Yamada, Yoshihisa; Yamaguchi, Totaro; and Ohshima, Satoshi, 4,598,154, Cl. 548-194.000.

Tanaka, Kazunobu; Matsuda, Akihisa; and Yoshida, Toshihiko, to Agency of Industrial Science & Technology; and Toa Nenryo Kogya, K.K. Thin film devices of silicon. 4,598,304, Cl. 357-4.000.

Tanaka, Kiyokazu: *See*—
Hamada, Masami; Tanaka, Kiyokazu; Kikuchi, Takeshi; Asai, Yasuhiro; Hayashi, Chihiro; and Ohtake, Fumio, 4,597,278, Cl. 72-187.000.

Tanaka, Toshiharu: *See*—
Usami, Toshimasa; and Tanaka, Toshiharu, 4,598,035, Cl. 430-138.000.

Tanaka, Toshiyuki: *See*—
Misaka, Takaaki; Furukawa, Takeshi; Onuma, Eiichi; Obana, Hiroshi; Fukuyama, Kyosuke; Tanaka, Toshiyuki; Murata, Hiroyuki; and Shimojima, Katuhiko, 4,597,537, Cl. 241-79.100.

Tanaka, Yoshikazu; Yamamuro, Sigeaki; Abo, Keiju; Kumura, Haruyoshi; Hirano, Hiroyuki; and Morimoto, Yoshiro, to Nissan Motor Co., Ltd. Method and apparatus for controlling reduction ratio of continuously variable transmission. 4,597,308, Cl. 74-866.000.

Tanaka, Yoshinori: *See*—
Iwata, Yoshiki; Kawase, Nobuo; Tanaka, Yoshinori; Miyake, Takashi; and Kawaura, Hiroshi, 4,597,459, Cl. 177-210.00R.

Taniguchi, Seiho: *See*—
Kotani, Kunio; Hayashi, Akio; and Taniguchi, Seiho, 4,598,127, Cl. 525-229.000.

Taniguchi, Yutaka, to Fuji Photo Film Co., Ltd. Radiation image read-out apparatus. 4,598,200, Cl. 250-327.200.

Tano, Terukuni, to Canon Kabushiki Kaisha; and Canon Hanbai Kabushiki Kaisha. Suck-back pump. 4,597,719, Cl. 417-317.000.

Tao, Frank F.: *See*—
Billimoria, Rustom M.; and Tao, Frank F., 4,597,775, Cl. 48-197.00R.

Tapphorn, David E.: *See*—
Tapphorn, Ralph M.; and Tapphorn, David E., 4,597,452, Cl. 172-574.000.

Tapphorn, Ralph M.; and Tapphorn, David E. Disk grading terrace plow. 4,597,452, Cl. 172-574.000.

Tarpley, Gerald W., Jr.; and Bardon, Anne M., to Ford Motor Company. Logic circuit for detecting reverse rotation of a take-up reel in a tape transport mechanism. 4,597,547, Cl. 242-191.000.

Tarzaiski, Richard J., to RCA Corporation. Apparatus for transmitting digital signals across a rotary gap. 4,598,325, Cl. 360-39.000.

Taszarek, Bruce J.: *See*—
Brill, Bernard A., III; Junker, Warren R.; White, John K.; Rana, Iftikhar A.; Bevilacqua, Bruce W.; Cooper, Frank W., Jr.; and Taszarek, Bruce J., 4,597,294, Cl. 73-623.000.

Tate, Kazuhito: *See*—
Moriya, Kunihiko; Tate, Kazuhito; Muroga, Goro; and Yanagida, Kazuhiro, 4,597,853, Cl. 208-22.000.

Taylor, Stephen L., to Aplin & Barrett, Ltd. Nisin as an antibotulinal agent for food products. 4,597,972, Cl. 426-36.000.

Teach, Charles C.: *See*—
Holmes, John G.; Messina, Elena R.; Resnick, Brian J.; and Teach, Charles C., 4,598,380, Cl. 364-513.000.

Technology Research Corporation: *See*—
Legatti, Raymond H., 4,598,331, Cl. 361-46.000.

Teiemu Giken Kabushiki Kaisha: *See*—
Takezono, Masatsugu, 4,597,353, Cl. 114-270.000.

Tektronix, Inc.: *See*—
Enochs, Raymond S., 4,597,617, Cl. 339-17.0CF.
Grellmann, H. Erwin; Jones, Keith E.; and Wright, John A., 4,598,334, Cl. 361-290.000.
McKibben, Barry A., 4,598,234, Cl. 315-370.000.
Peekema, Thomas E.; and Beehler, James O., 4,598,303, Cl. 346-140.00R.
Penney, Bruce J., 4,598,269, Cl. 340-347.0AD.
Penney, Bruce J.; and Nakamura, Michael D., 4,598,315, Cl. 358-149.000.

Telefonaktiebolaget LM Ericsson: *See*—
Eriksson, Erik A., 4,598,172, Cl. 179-16.0AA.

Temperli, Stefan: *See*—
Wagli, Peter; and Temperli, Stefan, 4,598,271, Cl. 340-511.000.

Tencor Instruments: *See*—
Galbraith, Lee K.; and Urbanek, Karel, 4,597,665, Cl. 356-237.000.
Wheeler, William R.; Kudinar, Rusmin; Kren, George J.; and Clementson, David D., 4,597,708, Cl. 414-331.000.

Tengler, John N.: *See*—
Ollis, Frederick R.; and Tengler, John N., 4,597,156, Cl. 29-564.400.

Terae, Nobuyuki: *See*—
Abe, Akira; and Terae, Nobuyuki, 4,597,894, Cl. 252-358.000.

Terasawa, Tsuneo; Kuniyoshi, Shinji; Takanashi, Akihiro; Kurosaki, Toshiei; Kawamura, Yoshio; and Hosaka, Sumio, to Hitachi, Ltd. Pattern detector. 4,597,669, Cl. 356-401.000.

Terauchi, Kiyoshi: *See*—
Sato, Tadashi; and Terauchi, Kiyoshi, 4,597,724, Cl. 418-55.000.

Terentiev, Otto A.; Burov, Anatoly V.; Vorobieva, Ekaterina Y.; Grudinka, Ekaterina I.; Nesterchuk, Gennady T.; Shapovalov, Oleg I.; Usmanov, Khamdam U.; Mirkamilov, Shavkat M.; Mirkamilov, Tolkun M.; and Sharkov, Vladimir V., to Leningradsky Tekhnologichesky Institute Tselljulozno-Bumazhnoi Promyshlennosti; and Proizvodstvennoe Obiedinenie "Litbumprom". Method for fiberboard manufacture. 4,597,928, Cl. 264-87.000.

Terneu, Robert: *See*—
Van Laethem, Robert; Van Cauter, Albert; and Terneu, Robert, 4,598,023, Cl. 428-432.000.

Terumo Corporation: *See*—
Fujii, Tadashi; and Hayakawa, Yoshinori (said Tadashi Fujii assors. to), 4,597,292, Cl. 73-599.000.
Watanabe, Masaharu, 4,597,868, Cl. 210-232.000.

Texaco Development Corporation: *See*—
Quintana, Manuel E.; and Estabrook, Lawrence E., 4,597,773, Cl. 48-197.00R.

Texaco Inc.: *See*—
Mott, George E., 4,597,350, Cl. 114-230.000.

Texas Instruments Incorporated: *See*—
Anderson, Daniel F., 4,598,388, Cl. 365-200.000.
Duvvury, Charvaka; and Strawn, Russel W., 4,598,389, Cl. 365-208.000.
Fino, Jeffrey J.; and Faulkner, George E., 4,598,406, Cl. 372-59.000.
Havemann, Robert H., 4,597,164, Cl. 29-576.00W.
Leach, Jerald G., 4,598,383, Cl. 364-900.000.
Mohan Rao, G. R., 4,597,805, Cl. 148-1.500.
Sexton, Joe F., 4,598,214, Cl. 307-291.000.

Th. Goldschmidt AG: *See*—
Fock, Jurgen, 4,598,141, Cl. 528-293.000.
Th. Kieserling & Albrecht GmbH. & Co.: *See*—
Junklewitz, Hugo, 4,597,489, Cl. 198-468.200.
Thieme, Helmut: *See*—
Heinemann, Otto; Baldus, Heinz-Dieter; Supp, Armin; Nanz, Hans; Thieme, Helmut; and Rasch, Heinz, 4,597,867, Cl. 210-218.000.
Thijssen, Henricus A. C.; and Arkenbout, Gerardus J., to Nederlandse Centrale Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek. Method for treatment in counter current of suspended particles with a liquid. 4,597,768, Cl. 23-299.000.
Thill, Gary A.; and Strand, Jerome E., to Minnesota Mining and Manufacturing Company. Long capillary tube hose assembly for fluid dispensing device. 4,597,754, Cl. 604-154.000.
Thinking Machines Corporation: *See*—
Hillis, W. Daniel, 4,598,400, Cl. 370-60.000.
Thoma, Martin; and Bunger, Paul, to MTU Motoren-und Turbinen-Union Muenchen GmbH. Galvanically deposited dispersion layer and method for making such layer. 4,598,016, Cl. 428-328.000.
Thoma, Wilhelm; Langel, Rolf; and Schroer, Walter, to Bayer Aktiengellschaft. Dispersion compositions, a process for their production and their use. 4,598,120, Cl. 524-591.000.
Thomas, Richard R. Stabilized wind direction indicator. 4,597,287, Cl. 73-188.000.
Thombs, David: *See*—
Faigen, Ivan; Eovine, Michael; and Thombs, David, 4,598,296, Cl. 343-730.000.
Thompson, John S.: *See*—
Boddie, James R.; Gadenz, Renato N.; and Thompson, John S., 4,598,358, Cl. 364-200.000.
Thompson, William H., III. Multiplex digital clock. 4,597,674, Cl. 368-83.000.
Thomsen, Svend E.: *See*—
Petersen, Hans C.; Thomsen, Svend E.; and Hansen, Hans L., 4,597,725, Cl. 418-61.00B.
Thomson Components - Mostek Corporation: *See*—
Morrison, Barry L.; and Tolson, James W., 4,597,714, Cl. 414-729.000.
Thomson-CSF: *See*—
Arques, Marc, 4,598,320, Cl. 358-213.000.
Thorn EMI plc: *See*—
Halberstadt, Alex L.; and Letchford, John A., 4,598,194, Cl. 219-464.000.
Thorpe, Gary H. G. H.: *See*—
Kricka, Larry J.; Thorpe, Gary H. G. H.; and Whitehead, Thomas P., 4,598,044, Cl. 435-28.000.
Thrower, Anthony, to USS Engineers and Consultants, Inc. Sliding gate valves and components thereof. 4,597,514, Cl. 222-600.000.
Tichy, James B. Long-stroke downhole pump. 4,597,722, Cl. 417-404.000.
Tiedje, J. Thomas; and Abeles, Benjamin, to Exxon Research and Engineering Co. Solar cell made from amorphous superlattice material. 4,598,164, Cl. 136-249.000.
Tiemann, Arthur C.: *See*—
Wagner, Gilbert F.; and Tiemann, Arthur C., 4,598,168, Cl. 174-115.000.
Timex Corporation: *See*—
Wuthrich, Paul; Daigle, Lyman R.; and Cozzolino, Gerald, 4,598,337, Cl. 361-401.000.
Tkachuk, Jury V.: *See*—
Efimov, Andrei S.; Melnik, Igor M.; Tkachuk, Jury V.; Tronko, Nikolai D.; Efimova, Elena K.; Obrosova, Irina G.; Gordienko, Vadim M.; Kaminsky, Leonid A.; Staninets, Vasily I.; Zborovsky, Jury L.; Mokhort, Nikolai A.; and Kirichek, Lora M., 4,598,081, Cl. 514-296.000.
Tloczynski, James J.; Budzol, Melvin; Ahola, Clifford J.; and Rine, James C., to Goodyear Tire & Rubber Company, The. Comminuting apparatus with improved rotor and stator composition. 4,597,536, Cl. 241-62.000.
Toa Nenryo Kogya, K.K.: *See*—
Tanaka, Kazunobu; Matsuda, Akihisa; and Yoshida, Toshihiko, 4,598,304, Cl. 357-4.000.
Toda, Atsushi: *See*—
Wada, Kiyoshi; Takeda, Hitoshi; Shibata, Hiroki; Toda, Atsushi; Yokoyama, Nobumi; and Yamada, Naohiro, 4,598,237, Cl. 318-16.000.
Toda, Ichiro: *See*—
Takagi, Kiyoshi; Toda, Ichiro; Hamasaki, Yoshiharu; and Wakamiya, Yoshinori, 4,598,377, Cl. 364-472.000.
Tokiwa, Hideharu: *See*—
Nakai, Tetsuya; Mimura, Yoshinori; Shinbori, Osamu; and Tokiwa, Hideharu, 4,597,786, Cl. 65-2.000.
Tokoro, Hisao: *See*—
Watanabe, Noboru; Tokoro, Hisao; and Ohhara, Syuichi, 4,598,001, Cl. 428-31.000.
Toku, Hiroshige: *See*—
Nishimura, Tamio; Toku, Hiroshige; Yoshii, Shin; Fukuyasu, Harumi; Matsumoto, Kuniomi; Kazuno, Youzo; and Watanabe, Tetsuro, 4,598,095, Cl. 514-632.000.
Tokumitsu, Yasuyuki: *See*—
Saito, Toshiyuki; Okubo, Naofumi; Kaneko, Yoshiaki; and Tokumitsu, Yasuyuki, 4,598,254, Cl. 330-286.000.
Tokyo Denshi Kagaku Co., Ltd.: *See*—
Nishimura, Toshihiro; Nakayama, Muneo; and Hashimoto, Akira, 4,597,882, Cl. 252-51.000.
Tokyo Electric Co., Ltd.: *See*—
Norigoe, Takashi; and Ochiai, Kuniaki, 4,597,680, Cl. 400-124.000.
Tokyo Kogaku Kikai Kabushiki Kaisha: *See*—
Yoshino, Hisakazu; and Takagi, Kazutoshi, 4,597,650, Cl. 351-214.000.
Tokyo Sanyo Electric Co., Ltd.: *See*—
Awane, Misao; Hara, Seiji; and Kobayashi, Satoshi, 4,598,379, Cl. 364-479.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Ando, Akio; Ochiai, Toshihiko; Nakanishi, Masae; Kawasaki, Shozo; and Nishida, Katsutoshi, 4,597,926, Cl. 264-67.000.
Iwai, Hiroshi, 4,597,166, Cl. 29-580.000.
Kinjo, Morishige; Kihara, Jyun-ichi; and Aoyagi, Keizo, 4,598,362, Cl. 364-200.000.
Matsuo, Katsuharu, 4,598,195, Cl. 219-497.000.
Naruse, Yujiro; and Shirouzu, Shunji, 4,598,207, Cl. 250-484.100.
Ono, Akira, 4,597,668, Cl. 356-372.000.
Sato, Tai, 4,598,382, Cl. 364-757.000.
Umemura, Yoshiyuki, 4,598,368, Cl. 364-414.000.
Tolson, James W.: *See*—
Morrison, Barry L.; and Tolson, James W., 4,597,714, Cl. 414-729.000.
Tomasic, Nicholas A.: *See*—
Heyne, Carl J.; Tomasic, Nicholas A.; and Wu, Jiing-Liang, 4,598,263, Cl. 335-14.000.
Tomco Mfg., Ltd.: *See*—
Kusuhara, Rei; Otsubo, Koichi; and Yatabe, Yasuo, 4,597,819, Cl. 156-345.000.
Tomida, Akira: *See*—
Okouchi, Isao; Izumi, Kenkichi; Takahashi, Sankichi; Mukai, Yasuteru; and Tomida, Akira, 4,597,871, Cl. 210-456.000.
Tomita, Naotaka: *See*—
Watanabe, Shigeru; Tomita, Naotaka; and Hori, Shigekazu, 4,598,424, Cl. 455-327.000.
Toncelli, Marcello. Interchangeable support disc for diamond-bearing plates of circular milling cutters. 4,597,225, Cl. 51-209.00R.
Toray Silicone Company, Ltd.: *See*—
Hirai, Kazuo; and Matsushita, Takao, 4,598,134, Cl. 528-17.000.
Torii & Co. Ltd.: *See*—
Fujii, Setsuro; Sato, Takuo; Kawamura, Hiroyuki; Yaegashi, Takashi; Kurumi, Masateru; and Aoyama, Takuo, 4,598,077, Cl. 514-233.000.
Torley, Jozsef: *See*—
Toth, Edit; Torley, Jozsef; Palosi, Eva; Szebereneyi, Szabolcs; Szporny, Laszlo ; Gorog, Sandor; and Hajdu, Istvan, 4,598,080, Cl. 514-277.000.
Toseland, Bernard A.: *See*—
Carr, Richard V. C.; Sawicki, John E.; and Toseland, Bernard A., 4,597,875, Cl. 210-710.000.
Toth, Edit; Torley, Jozsef; Palosi, Eva; Szebereneyi, Szabolcs; Szporny, Laszlo ; Gorog, Sandor; and Hajdu, Istvan, to Richter Gedeon Vegyeszeti Gyar Rt. Certain-2-methyl-6-{4-[1-phenyl-1-hydroxypropyl]-phenoxymethyl}pyridines which inhibit microsonal monoxygenase systems in liver. 4,598,080, Cl. 514-277.000.
Toyo Yakushoku Kogyo Co. Ltd.: *See*—
Hikino, Hiroshi; and Hayashi, Teruaki, 4,598,069, Cl. 514-54.000.
Toyoda Gosei Co., Ltd.: *See*—
Kimura, Saburo, 4,598,002, Cl. 428-36.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Furukawa, Yasuharu, 4,597,372, Cl. 123-572.000.
Kawaguchi, Hiroshi; Nishina, Shuho; Nakanishi, Nobuyasu; and Honda, Yukio, 4,597,307, Cl. 74-512.000.
Shiraishi, Daiichi; Iwasaki, Eiji; and Fukumoto, Ryoichi, 4,597,223, Cl. 49-352.000.
Takeda, Yoshiki, 4,597,311, Cl. 74-694.000.
Yoshitsugu, Noritada; Sugiura, Motonobu; and Matsuzaki, Yutaka, 4,597,587, Cl. 280-807.000.
Toyota Motor Corp.: *See*—
Hagiwara, Yoshiyuki; and Morishita, Teru, 4,597,677, Cl. 384-105.000.
Tozer, Michael J. C., to Heat Transfer Technology Limited. Cylinder end seal. 4,597,596, Cl. 285-187.000.
Trabert, Hans-Gerhard, to General Motors Corporation. Mounting arrangement of a motor vehicle front-end component made of plastics. 4,597,603, Cl. 296-194.000.
Transducer Limited Partnership: *See*—
Carr, William W., 4,598,260, Cl. 331-135.000.
Transpec, Inc.: *See*—
Manning, Donald L., 4,597,601, Cl. 293-122.000.
Trappler, Edward H. Freeze dry process and structure. 4,597,188, Cl. 34-5.000.
Trickel, Neal E.; and Strommen, Sherwood V. Tracer unit for ammunition. 4,597,810, Cl. 149-15.000.
Trio Kabushiki Kaisha: *See*—
Shiojima, Kazuo, 4,598,426, Cl. 455-266.000.
Tronko, Nikolai D.: *See*—
Efimov, Andrei S.; Melnik, Igor M.; Tkachuk, Jury V.; Tronko, Nikolai D.; Efimova, Elena K.; Obrosova, Irina G.; Gordienko, Vadim M.; Kaminsky, Leonid A.; Staninets, Vasily I.; Zborovsky, Jury L.; Mokhort, Nikolai A.; and Kirichek, Lora M., 4,598,081, Cl. 514-296.000.
Tropschuh, Walter: *See*—
Muller, Gerhard; Hahn, Hans; and Tropschuh, Walter, 4,597,752, Cl. 493-410.000.

Troughton, Thomas D., to Rheem Manufacturing Corporation. Industrial container with removable end closures and method of manufacture. 4,597,502, Cl. 220-67.000.

Trouw, Norman S., to Celanese Corporation. Process for the production of polybenzimidazole foams. 4,598,099, Cl. 521-77.000.

Trubiano, Antoine, to Cari-All Inc. Drawer-like container assembly. 4,597,616, Cl. 312-246.000.

Trudeau, David L., Sr. Umbrella, parasol and the like. 4,597,400, Cl. 135-18.000.

Truesdale, Larry K., to Hoffmann-La Roche Inc. Intermediate phenolic compounds for the catalytic synthesis of chromans. 4,598,160, Cl. 560-144.000.

Truline C.N.C., Inc.: *See—*
Mohr, Gregory J., 4,597,717, Cl. 417-265.000.

Trutek Research, Inc.: *See—*
Koziol, Jeffrey; Nowacki, Christopher; and Brisson, Alfred G., 4,597,388, Cl. 128-303.100.
Nowacki, Christopher; and Brisson, Alfred G., 4,598,279, Cl. 340-626.000.

TRW Inc.: *See—*
Chen, Ming H., 4,598,262, Cl. 333-208.000.
O'Keefe, John D., 4,598,408, Cl. 372-94.000.

TRW Probe Electronics Co. Ltd: *See—*
Harbour, John; and Barnett, John D., 4,597,154, Cl. 29-525.000.

TRW Repa GmbH: *See—*
Fohl, Artur, 4,597,544, Cl. 242-107.40B.
Wier, Franz, 4,597,141, Cl. 24-633.000.

Tsai, James T. Conformable electromagnetic shield. 4,598,165, Cl. 174-36.000.

Tsang, Juine-Kai, to Zilog, Inc. Method of improving film adhesion between metallic silicide and polysilicon in thin film integrated circuit structures. 4,597,163, Cl. 29-576.00B.

Tsuji, Kiyoshi: *See—*
Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tsuji, Kiyoshi, 4,598,147, Cl. 544-238.000.

Tsuji, Shinsaku, to Nissan Motor Co., Ltd. Transmission shift lever supporting structure. 4,597,306, Cl. 74-473.00P.

Tsunemitsu, Katsuhiko: *See—*
Fujisaki, Hideaki; Nieda, Seiichi; and Tsunemitsu, Katsuhiko, 4,598,150, Cl. 546-152.000.

Tsuzi, Kiyoaki: *See—*
Sugisawa, Ko; Sekiguchi, Kazuya; Tsuzi, Kiyoaki; and Ono, Akinobu, 4,597,945, Cl. 422-113.000.

Tucker, Derry E. Automatic garage door opener. 4,597,224, Cl. 49-199.000.

Tucque, Andre: *See—*
Deszynski, Andrew W.; and Tucque, Andre, 4,597,609, Cl. 299-6.000.

Tudela, Manuel R., to USI Agri-Business Company Inc. Feed proportioner. 4,597,361, Cl. 119-52.00B.

Tung, Min-Hsiung G.; and Yanagisawa, Hiroshi, to International Business Machines Corporation. Method for converting the number of bits of input bit stream. 4,598,283, Cl. 340-731.000.

Tunn, Ulf: *See—*
Schweikert, Hans-Udo; Tunn, Ulf; Senge, Theodor; and Numann, Friedmund, 4,598,072, Cl. 514-170.000.

Turley, Roger W., to Hundon Forge Limited. Implanting method and device. 4,597,753, Cl. 604-61.000.

Turner, John H. W., to Manchem Limited. Oxo-aluminum complexes. 4,597,800, Cl. 106-264.000.

Tuten, William J.: *See—*
Crosby, Kennith D.; Tuten, William J.; Black, Harold W.; and Bergquist, Bertil R., 4,597,487, Cl. 194-209.000.

Uehara, Katsuharu: *See—*
Kitayama, Yukio; Ochiai, Izumi; Nozawa, Yoshio; Miyagi, Masahiro; Ayabe, Tadaaki; and Uehara, Katsuharu, 4,597,171, Cl. 29-727.000.

Uehara, Mikio: *See—*
Aoyama, Takeo; Magara, Syoji; Yokoyama, Shigeki; Kamei, Tadashi; and Uehara, Mikio, 4,597,818, Cl. 156-308.200.

Ueno, Sadayasu: *See—*
Takahasi, Toru; and Ueno, Sadayasu, 4,597,850, Cl. 204-426.000.

Uhrig, Heinz; Ehl, Klaus; and Deubel, Reinhold, to Hoechst Aktiengesellschaft. Surface-active compounds on the basis of arylated fatty substances and their use. 4,597,906, Cl. 260-401.000.

Ukigai, Toshiyuki: *See—*
Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, 4,597,879, Cl. 252-8.55D.

Ulfers, Bernard G.: *See—*
Gerber, Hermann E.; and Ulfers, Bernard G., 4,597,666, Cl. 356-338.000.

Ullberg, Carl: *See—*
Lachonius, Leif; and Ullberg, Carl, 4,597,492, Cl. 198-852.000.

Ullman, Alan Z.; Silverman, Jacob; and Friedman, Joseph, to Rockwell International Corporation. Hydropyrolysis process. 4,597,776, Cl. 48-197.00R.

Ulrich, Alfred: *See—*
Wondra, Arthur; Weller, Gerhard; and Ulrich, Alfred, 4,597,627, Cl. 339-196.00M.

Umemura, Yoshiyuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Superposed image display device. 4,598,368, Cl. 364-414.000.

Umetani, Keiji; Suzuki, Atsushi; Nakagawa, Manabu; Yoshida, Minoru; Kawaguchi, Fumio; Yamada, Hiromichi; and Koike, Kouichi, to Hitachi, Ltd.; and Hitachi Medical Corporation. Multielement radiation detector. 4,598,203, Cl. 250-366.000.

Union Carbide Corporation: *See—*
Hinchey, Richard J.; and Caglione, Alexander J., 4,597,956, Cl. 423-328.000.
Keogh, Michael J.; and Williams, Gary H., 4,598,116, Cl. 524-398.000.
Kotani, Kunio; Hayashi, Akio; and Taniguchi, Seiho, 4,598,127, Cl. 525-229.000.
Robeson, Lloyd M.; and Papuga, Donald M., 4,598,130, Cl. 525-439.000.
Stratta, Julius J.; and Stasiak, Nicholas, 4,597,801, Cl. 106-308.00Q.

Union Oil Company of California: *See—*
Hass, Robert H., 4,597,954, Cl. 423-138.000.

United Kingdom Atomic Energy Authority: *See—*
Kennedy, Peter; and Parkinson, Kenneth, 4,597,923, Cl. 264-29.400.

U.S. Banknote Corporation: *See—*
Colgate, Gilbert, Jr., 4,597,814, Cl. 156-219.000.

United States of America
Air Force: *See—*
Injeyan, Hagop; and Wang, John H. S., 4,598,409, Cl. 372-89.000.
Army: *See—*
Allen, Henry C.; and Clarke, Frederick W., 4,597,924, Cl. 264-3.600.
Almaula, Bipin C., 4,597,873, Cl. 210-649.000.
Almaula, Bipin C., 4,597,947, Cl. 422-191.000.
Ballato, Arthur, 4,598,224, Cl. 310-313.00R.
Ballato, Arthur, 4,598,261, Cl. 333-195.000.
Bradford, Michael P., 4,598,280, Cl. 340-631.000.
Ducote, Marjorie E., 4,597,811, Cl. 149-19.920.
Hunter, Joe S.; and Ruffin, Paul B., 4,597,255, Cl. 57-62.000.
Wagner, Gilbert F.; and Tiemann, Arthur C., 4,598,168, Cl. 174-115.000.
Energy: *See—*
Bollinger, Lawrence R.; and Crawford, Donald C., 4,597,934, Cl. 376-235.000.
Ergun, Sabri; Schaleger, Larry L.; Wrathall, James A.; and Yaghoubzadeh, Nasser, 4,597,832, Cl. 162-234.000.
Johnson, David H., 4,597,360, Cl. 119-3.000.
Stinton, David P.; Lackey, Walter J.; and Lauf, Robert J., 4,598,024, Cl. 428-448.000.
Van Devender, John P.; and Emin, David, 4,598,338, Cl. 361-435.000.
Health and Human Services: *See—*
Rice, Kenner C.; Rafferty, Michael F.; Jacobson, Arthur E.; Contreras, Patricia; O'Donohue, Thomas L.; Lessor, Ralph A.; and Mattson, Mariena V., 4,598,153, Cl. 546-229.000.
National Aeronautics and Space Administration: *See—*
Kourtides, Demetrius A.; Parker, John A.; and Hsu, Ming-Ta S., 4,598,007, Cl. 428-116.000.
Navy: *See—*
Chino, John J.; Swayne, David S.; and Gilmour, Richard J., 4,597,173, Cl. 29-741.000.
Flores, Arnold, 4,597,631, Cl. 350-96.200.
Gerber, Hermann E.; and Ulfers, Bernard G., 4,597,666, Cl. 356-338.000.
Guhse, Raymond A., 4,598,294, Cl. 343-17.700.
Hoffman, Leonard M.; and Kimball, John B., 4,597,332, Cl. 102-505.000.
Mako, Frederick M.; Pasour, John A.; and Roberson, Charles W., 4,598,247, Cl. 324-77.00R.
Reeser, Floyd H.; and Quinn, Francis G., 4,597,345, Cl. 114-20.00R.
Ripin, Barrett H.; and Whitlock, Robert R., 4,597,933, Cl. 376-153.000.
Seitel, Steven C.; and Marrs, C. Denton, 4,597,639, Cl. 350-363.000.

U.S. Philips Corporation: *See—*
Brand, Gerd; and Moring, Wilhelm, 4,598,310, Cl. 358-19.000.
Hennings, Detlev F. K.; Janssen, Rolf P.; and Reijnen, Piet, 4,598,055, Cl. 501-137.000.
Kessels, Jozef L. W.; Schoenmakers, Wijnand J.; and Vrielink, Hendrik, 4,598,385, Cl. 364-900.000.
Lohn, Klaus B., 4,598,349, Cl. 363-8.000.
Marin, Guy F. M.; and Hethuin, Serge, 4,598,289, Cl. 340-870.340.
Schagen, Pieter, 4,598,233, Cl. 315-366.000.

United States Shoe Corporation, The: *See—*
Strasinger, David T., 4,597,197, Cl. 36-56.000.

United Technologies Corporation: *See—*
Duhl, David N.; and Chen, Otis Y., 4,597,809, Cl. 148-404.000.
Goodman, Robert B., 4,597,319, Cl. 91-27.000.
Harris, Harold S., 4,597,258, Cl. 60-39.310.
King, Daniel L., 4,597,187, Cl. 33-552.000.
Sevigny, Roger, 4,597,174, Cl. 29-741.000.

Unites States Steel Corporation: *See—*
Cutter, Louis A., 4,598,123, Cl. 525-84.000.

Universal Electric Company: *See—*
Stone, Thomas W., 4,598,220, Cl. 310-90.000.

University of Alabama, The: *See—*
April, Gary C.; and Nayak, Ramkrishna G., 4,597,830, Cl. 162-32.000.

University of California, The Regents of the: *See—*
Papahadjopoulos, Demetrios P.; and Heath, Timothy D., 4,598,051, Cl. 436-512.000.

University of Florida: *See—*
Green, Alex E. S.; and Green, Bruce A. S., 4,597,342, Cl. 110-347.000.

University of Iowa Research Foundation: *See*—
Walder, Joseph A., 4,598,064, Cl. 514-6.000.
University of Maryland: *See*—
Gokel, George W.; and Gatto, Vincent J., 4,597,903, Cl. 260-330.600.
University of Tennessee Research Corp., The: *See*—
Beachey, Edwin H., 4,597,967, Cl. 424-88.000.
Unruh, N. Bruce: *See*—
Williams, Robert C., III; and Unruh, N. Bruce, 4,597,124, Cl. 8-158.000.
UOP Inc.: *See*—
Kuchar, Paul J.; Sampson, Robert W.; and Pacanowski, Ronald F., 4,597,285, Cl. 73-29.000.
Ward, Dennis J., 4,597,946, Cl. 422-190.000.
Upjohn Company, The: *See*—
Szmuszkovicz, Jacob; McCall, John M.; Kaplan, Lester J.; and McMillan, Moses W., 4,598,088, Cl. 514-429.000.
Upp, Daniel C.; and Bartholomay, William G., to ITT Corporation. Duplex transmission mechanism for digital telephones. 4,598,396, Cl. 370-27.000.
Urbanek, Karel: *See*—
Galbraith, Lee K.; and Urbanek, Karel, 4,597,665, Cl. 356-237.000.
Ury, Jack R. Positioning unit for core drill stand. 4,597,185, Cl. 33-185.00R.
Usami, Toshimasa; and Tanaka, Toshiharu, to Fuji Photo Film Co., Ltd. Heat-sensitive recording material containing microcapsules containing coloring component(s) and organic solvent. 4,598,035, Cl. 430-138.000.
Usami, Toshiro; Mikata, Yuuichi; and Shinada, Kazuyoshi, to Kabushiki Kaisha Toshiba. Method of manufacturing SiO_2-Si interface for floating gate semiconductor device. 4,597,159, Cl. 29-571.000.
Ushifusa, Nobuyuki; Ogihara, Satoru; and Noro, Takanobu, to Hitachi, Ltd. Multilayered ceramic circuit board. 4,598,167, Cl. 174-68.500.
USI Agri-Business Company Inc.: *See*—
Tudela, Manuel R., 4,597,361, Cl. 119-52.00B.
USM Corporation: *See*—
Hanson, Raymond, 4,598,193, Cl. 219-215.000.
Usmanov, Khamdam U.: *See*—
Terentiev, Otto A.; Burov, Anatoly V.; Vorobieva, Ekaterina Y.; Grudinka, Ekaterina I.; Nesterchuk, Gennady T.; Shapovalov, Oleg I.; Usmanov, Khamdam U.; Mirkamilov, Shavkat M.; Mirkamilov, Tolkun M.; and Sharkov, Vladimir V., 4,597,928, Cl. 264-87.000.
USS Engineers and Consultants, Inc.: *See*—
Thrower, Anthony, 4,597,514, Cl. 222-600.000.
Utsugi, Katsumi, to Nippon Oils & Fats Co., Ltd.; and Nichiyu Giken Kogyo Co., Ltd. Pressure-resistant buoyancy material. 4,598,106, Cl. 523-218.000.
Utumi, Masahiro: *See*—
Miyoshi, Takahito; Masuyama, Kenichi; Okutu, Toshimitu; Utumi, Masahiro; Fujiyama, Masaaki; and Kanazawa, Minoru, 4,598,014, Cl. 428-323.000.
Vadala', Giuseppe. Highly insulating brick for masonry. 4,597,238, Cl. 52-606.000.
Valcarce, Eduardo M.: *See*—
Aliberti, Vincent A.; Kruse, Robert L.; and Valcarce, Eduardo M., 4,598,124, Cl. 525-86.000.
Valco Cincinnati, Inc.: *See*—
Santefort, Richard A., 4,597,721, Cl. 417-393.000.
Valentine, Lewis J.: *See*—
Hicks, Bradford W.; Rolf, Jeffrey O.; and Valentine, Lewis J., 4,597,312, Cl. 74-695.000.
Valmet Oy: *See*—
Panttila, Vaino, 4,597,310, Cl. 74-665.0GA.
Van Leer S.A. (Proprietary) Limited: *See*—
MacLarty, Bernard G., 4,597,508, Cl. 222-83.000.
Van Benschoten, Peter J.: *See*—
Podvin, T. Charles; and Van Benschoten, Peter J., 4,597,643, Cl. 350-507.000.
Van Cauter, Albert: *See*—
Van Laethem, Robert; Van Cauter, Albert; and Terneu, Robert, 4,598,023, Cl. 428-432.000.
Van Dell, William R.: *See*—
Benjamin, John L.; and Van Dell, William R., 4,597,822, Cl. 156-612.000.
van de Nieuwelaar, J. A., to Stork PMT B.V. Device for transferring slaughtered poultry. 4,597,133, Cl. 17-24.000.
VanDerBel, Frans G., to Luxtec Corporation. Fiber-optic illuminated vaginal speculum. 4,597,383, Cl. 128-18.000.
Vander Meer, James M., to Proctor & Gamble Company, The. Detergent compositions containing ethoxylated amines having clay soil removal/anti-redeposition properties. 4,597,898, Cl. 252-529.000.
van der Meer, Paulus; and Koert, Jan P., to IHC Holland N.V. Detachable coupling for a suction head. 4,597,200, Cl. 37-63.000.
Van Devender, John P.; and Emin, David, to United States of America, Energy. Reusable fast opening switch. 4,598,338, Cl. 361-435.000.
van Dijk, Nicolaas: *See*—
Goudriaan, Frans; Hake, Timothy S.; Ladeur, Peter; Moureaux, Patrique; Saint, Jean-Paul; and van Dijk, Nicolaas, 4,598,059, Cl. 502-228.000.
VanHooser, William B.; and Williams, Robert J. W., to Environmental Elements Corp. Filter bag tensioning system and method. 4,597,782, Cl. 55-378.000.
VanKessel, Theodore G.: *See*—
Shaw, Jerry C.; and VanKessel, Theodore G., 4,598,384, Cl. 364-900.000.
Van Laethem, Robert; Van Cauter, Albert; and Terneu, Robert, to Glaverbel. Method for forming a coating on a hot vitreous substrate by spraying the substrate while heating the zone that is sprayed and product. 4,598,023, Cl. 428-432.000.
Van Marcke, Karel C., to International Sanitary Ware Manuf. Cy. Plumbing fixture. 4,597,404, Cl. 137-1.000.
VanRaden, Rebecca A. H.: *See*—
Briscoe, Terry L.; and VanRaden, Rebecca A. H., 4,597,713, Cl. 414-690.000.
Vargo, Richard D.: *See*—
Miller, Richard S.; Bright, Randall P.; Vargo, Richard D.; and Dreyfuss, Patricia M., 4,598,012, Cl. 428-228.000.
Varian Associates, Inc.: *See*—
Brunelli, Richard J.; and Carter, James C., Jr., 4,598,208, Cl. 250-515.100.
Wells, Gregory J., 4,597,421, Cl. 141-5.000.
VEB Werk fuer Fernsehelektronik im VEB Kombinat Mikroelektronik: *See*—
Zaschke, Horst; Vorbrodt, Hans-Matthias; Fuchs, Wilfried; Wiegeleben, Adelbert; and Demus, Dietrich, 4,597,892, Cl. 252-299.610.
Vedvik, Andrew H.; and Merdler, Myron J., to Oscar Mayer Foods Corporation. Stack handling method and apparatus. 4,597,704, Cl. 414-28.000.
Vehling, Ernst: *See*—
Bauch, Ernst; and Vehling, Ernst, 4,597,142, Cl. 28-269.000.
Venture Innovations, Inc.: *See*—
House, Roy F.; and Granquist, Victor M., 4,597,878, Cl. 252-8.50M.
Verdeau, Jean-Jacques; and Le Helloco, Michel R., to Framatome & Cie. Nuclear reactor having a control cluster guide. 4,597,935, Cl. 376-353.000.
Vernay Laboratories, Inc.: *See*—
Ford, John R., 4,598,278, Cl. 340-608.000.
Vial, Albany R.: *See*—
Gabelish, Peter W.; Vial, Albany R.; and Roberts, Russell W., 4,597,321, Cl. 91-470.000.
Vicari, John J.: *See*—
Shepler, John E.; Rinker, Douglas A.; Beneditz, Bruce D.; Vicari, John J.; and Faulkner, Dennis T., 4,598,355, Cl. 364-184.000.
Vinci, James N., to Lubrizol Corporation, The. Metal working using lubricants containing basic alkali metal salts. 4,598,026, Cl. 428-467.000.
Vinzant, Warren J.: *See*—
Pierce, Gerald A.; Buxton, James L.; Peppers, Norman A.; and Vinzant, Warren J., 4,598,393, Cl. 369-46.000.
Vogt, Hans; and Spiegel, Erwin, to Ford Motor Company. Sandwich component for the bodywork of a motor vehicle. 4,598,008, Cl. 428-117.000.
Vohr, John H.; Miller, William H.; and Perkins, Jeffrey J., to General Electric Company. Hybrid bearing. 4,597,676, Cl. 384-114.000.
Volk, Hans-Joachim: *See*—
Forkel, Michael; Dallwig, Claus; and Volk, Hans-Joachim, 4,597,607, Cl. 297-468.000.
Volk, Henry, to Dow Chemical Company, The. Stabilized water-in-oil emulsions of a polyacrylate. 4,598,119, Cl. 524-215.000.
Voltarc Tubes, Inc.: *See*—
Sorrell, Malcolm E., 4,598,343, Cl. 362-216.000.
von Angerer, Erwin: *See*—
Schonenberger, Helmut; Wappes, Beate; Jennerwein, Margaretha; von Angerer, Erwin; and Engel, Jurgen, 4,598,091, Cl. 514-492.000.
Vora, Kishore N.: *See*—
Campbell, Donald N.; Vora, Kishore N.; and Davis, Robert C., Jr., 4,597,299, Cl. 73-864.810.
Vorbrodt, Hans-Matthias: *See*—
Zaschke, Horst; Vorbrodt, Hans-Matthias; Fuchs, Wilfried; Wiegeleben, Adelbert; and Demus, Dietrich, 4,597,892, Cl. 252-299.610.
Vorobieva, Ekaterina Y.: *See*—
Terentiev, Otto A.; Burov, Anatoly V.; Vorobieva, Ekaterina Y.; Grudinka, Ekaterina I.; Nesterchuk, Gennady T.; Shapovalov, Oleg I.; Usmanov, Khamdam U.; Mirkamilov, Shavkat M.; Mirkamilov, Tolkun M.; and Sharkov, Vladimir V., 4,597,928, Cl. 264-87.000.
Vrielink, Hendrik: *See*—
Kessels, Jozef L. W.; Schoenmakers, Wijnand J.; and Vrielink, Hendrik, 4,598,385, Cl. 364-900.000.
W. Schmidt GmbH & Co. KG: *See*—
Dimitriou, Michael H., 4,597,978, Cl. 426-492.000.
WABCO Westinghouse Fahrzeugbremsen GmbH: *See*—
Klatt, Alfred, 4,598,374, Cl. 364-424.100.
Wacker-Chemie GmbH: *See*—
Hockemeyer, Friedrich; and Preiner, Gerhard, 4,597,987, Cl. 427-54.100.
Wada, Akio: *See*—
Sugiyama, Kenkichi; Saito, Muneo; and Wada, Akio, 4,597,943, Cl. 422-70.000.
Wada, Kiyoshi; Takeda, Hitoshi; Shibata, Hiroki; Toda, Atsushi; Yokoyama, Nobumi; and Yamada, Naohiro, to Koito Manufacturing Co., Ltd. Power window control apparatus. 4,598,237, Cl. 318-16.000.
Wada, Toshiaki; Furukawa, Mitsuhiko; Nagano, Mitsuyoshi; Miyahara, Michito; and Mori, Shigeki, to Sumitomo Special Metals Co., Ltd.; and Nippon Tungsten Co., Ltd. Alumina base substrate of recording head and process for the production thereof. 4,598,052, Cl. 501-87.000.
Wagdy, Mohamed K., to Signode Corporation. Magazine interlock for a fastener driving device. 4,597,517, Cl. 227-8.000.

Wagerer, Helmut F.: *See*—
Lorenzi, Donald E.; and Wagerer, Helmut F., 4,598,250, Cl. 324-220.000.

Wagli, Peter; and Temperli, Stefan, to Cerberus AG. Circuit arrangement for monitoring noise levels of detectors arranged in an alarm installation. 4,598,271, Cl. 340-511.000.

Wagner, Gilbert F.; and Tiemann, Arthur C., to United States of America, Army. Strain sensitive cable. 4,598,168, Cl. 174-115.000.

Wagner, Richard C. Feed mechanism for a patty making machine. 4,597,134, Cl. 17-32.000.

Wagstaff Engineering, Inc.: *See*—
Collins, Richard J.; Wagstaff, Frank E.; and Wagstaff, William G., 4,597,432, Cl. 164-444.000.

Wagstaff, Frank E.: *See*—
Collins, Richard J.; Wagstaff, Frank E.; and Wagstaff, William G., 4,597,432, Cl. 164-444.000.

Wagstaff, William G.: *See*—
Collins, Richard J.; Wagstaff, Frank E.; and Wagstaff, William G., 4,597,432, Cl. 164-444.000.

Waido, Richard P.: *See*—
Brandstetter, Robert W.; Lynn, Otto F.; Reich, Abraham; and Waido, Richard P., 4,597,630, Cl. 350-3.830.

Waitz, Jay A.; Patel, Mahesh G.; Marquez, Joseph A.; Kalyanpur, Manohar G.; and Horan, Ann C., to Schering Corporation. Antibiotic 13-384 complex from *Micromonospora carbonacea* var *africana*. 4,597,968, Cl. 424-118.000.

Wakabayashi, Hiroshi, to Nippon Kogaku K. K. Compact camera capable of encasing a phototaking optical system. 4,597,657, Cl. 354-195.120.

Wakabayashi, Tetsushi; and Muratake, Kiyoshi, to Fujitsu Limited. Integrated circuit device having package with bypass capacitor. 4,598,307, Cl. 357-75.000.

Wakamiya, Yoshinori: *See*—
Takagi, Kiyoshi; Toda, Ichiro; Hamasaki, Yoshiharu; and Wakamiya, Yoshinori, 4,598,377, Cl. 364-472.000.

Walder, Joseph A., to University of Iowa Research Foundation. Alpha-alpha cross-linked hemoglobins. 4,598,064, Cl. 514-6.000.

Wallace, David A.: *See*—
Feldon, Steven E.; Broome, Barry G.; and Wallace, David A., 4,597,648, Cl. 351-212.000.

Wallace, Norman R., to Bechtel International Corporation. Swivel-less coupling apparatus. 4,597,595, Cl. 285-119.000.

Walling, Jorg-Hein; and Murphy, Peter M., to Northern Telecom Limited. Provision of plastic insulation upon an electrical conductor. 4,597,921, Cl. 264-23.000.

Wallow, Peter: *See*—
Bocker, Jurgen; and Wallow, Peter, 4,597,333, Cl. 102-518.000.

Walter, Chris J.: *See*—
Berkovich, Semyon; Wilson, Colleen R.; and Walter, Chris J., 4,598,411, Cl. 375-27.000.

Walter, Michael: *See*—
Walter, Peter; and Walter, Michael, 4,597,762, Cl. 623-1.000.

Walter, Peter; and Walter, Michael, to HEYL Chemisch-pharmazeutische Fabrik GmbH & Co KG. Collagen preparation. 4,597,762, Cl. 623-1.000.

Walters, D. F.; Brunson, David T.; and Bell, William R., to Dresser Industries, Inc. Rock bit lubrication system. 4,597,455, Cl. 175-228.000.

Walton, Dale W. Three-dimensional assembly puzzle with asymmetrical pieces that interlock interchangeably. 4,597,579, Cl. 273-156.000.

Walton, Lawrence J.: *See*—
Bloor, Trevor J.; and Walton, Lawrence J., 4,597,597, Cl. 285-196.000.

Wang, John H. S.: *See*—
Injeyan, Hagop; and Wang, John H. S., 4,598,409, Cl. 372-89.000.

Wang, Shih-Ping; Morgan, Russell H.; and Specht, Donald F., to Picker International, Inc. Tomography apparatus and method. 4,598,369, Cl. 364-414.000.

Wappes, Beate: *See*—
Schonenberger, Helmut; Wappes, Beate; Jennerwein, Margaretha; von Angerer, Erwin; and Engel, Jurgen, 4,598,091, Cl. 514-492.000.

Ward, Dennis J., to UOP Inc. Vertical tube reactor with serial downward flow through a plurality of sets of particulate containing tubes. 4,597,946, Cl. 422-190.000.

Ward, Kevin B.: *See*—
Kraushaar, Robert J.; and Ward, Kevin B., 4,597,629, Cl. 350-1.500.

Ward, Michael: *See*—
Mitchell, Keith J.; Barber, Norman R.; and Ward, Michael, 4,597,689, Cl. 403-322.000.

Ward, Ronald D., Jr.: *See*—
Smith, Walter A.; Small, James R.; and Ward, Ronald D., Jr., 4,598,410, Cl. 375-3.000.

Ware, Charles H.; Rose, Leslie C.; and Allen, Joseph C., to World Energy Systems, Inc. Recovery of oil by in situ hydrogenation. 4,597,441, Cl. 166-261.000.

Warner, Charles P.: *See*—
Collins, Jerry C.; Warner, Charles P.; Henkener, Jerry A.; and Glauser, Rolf, 4,598,290, Cl. 340-850.000.

Warner-Lambert Company: *See*—
Barth, Hubert; Fritschi, Edgar; Ganser, Volker; Hartenstein, Johannes; Herrmann, Manfred; and Satzinger, Gerhard, 4,598,076, Cl. 514-230.000.
Bruso, Loran H., 4,597,493, Cl. 206-363.000.
Horwell, David C., 4,598,087, Cl. 514-429.000.
Sharma, Shri C.; and Yang, Robert K., 4,597,970, Cl. 426-5.000.

Warren, Thomas R.: *See*—
Snow, William E.; and Warren, Thomas R., 4,597,995, Cl. 427-231.000.

Warthan, Jerry G.: *See*—
Henning, Haden V.; Warthan, Jerry G.; and Fajt, John, 4,598,229, Cl. 313-493.000.

Watanabe, Hiromichi: *See*—
Majima, Teiji; and Watanabe, Hiromichi, 4,597,826, Cl. 156-643.000.

Watanabe, Masaharu, to Terumo Corporation. Body fluid filter device. 4,597,868, Cl. 210-232.000.

Watanabe, Masaki; Yagasaki, Akio; Murayama, Toru; and Yonekura, Kazuya, to Honda Giken Kogyo Kabushiki Kaisha. Method of manufacturing a windshield having a coating of varying thickness. 4,597,931, Cl. 264-129.000.

Watanabe, Noboru; Tokoro, Hisao; and Ohhara, Syuichi, to Japan Styrene Paper Corporation. Bumper core and process producing same. 4,598,001, Cl. 428-31.000.

Watanabe, Noboru: *See*—
Ikuma, Sadao; Aoki, Yuji; and Watanabe, Noboru, 4,598,126, Cl. 525-194.000.

Watanabe, Shigeru; Tomita, Naotaka; and Hori, Shigekazu, to Kabushiki Kaisha Toshiba. Microwave mixer circuit. 4,598,424, Cl. 455-327.000.

Watanabe, Tetsuro: *See*—
Nishimura, Tamio; Toku, Hiroshige; Yoshii, Shin; Fukuyasu, Harumi; Matsumoto, Kuniomi; Kazuno, Youzo; and Watanabe, Tetsuro, 4,598,095, Cl. 514-632.000.

Watson, John A.: *See*—
Garnett, Donald W.; and Watson, John A., 4,597,155, Cl. 29-564.000.

Watson, Trevor F. Biopsy instrument. 4,597,385, Cl. 128-751.000.

Wean United, Inc.: *See*—
Wilson, Richard F., 4,597,521, Cl. 228-160.000.

Weatherby, Inc.: *See*—
Jennie, Fred, 4,597,212, Cl. 42-70.00E.

Weber, Kenneth E.; and Oberlin, Dirk, to Amoco Corporation. Rubber composition and method. 4,598,105, Cl. 523-215.000.

Webster, Donald, to Kaiser Aluminum & Chemical Corporation. Aluminum-based composite product of high strength and toughness. 4,597,792, Cl. 75-249.000.

Weeks, Warran D., to Root Spring Scraper Company. V-shaped highway snow plows. 4,597,202, Cl. 37-232.000.

Wefel, Jerry D.: *See*—
Aleem, Mohd A.; Lobsinger, James L.; and Wefel, Jerry D., 4,598,218, Cl. 310-42.000.

Wehrs, David L., to Rosemount Inc. Frequency to current converter circuit. 4,598,251, Cl. 328-140.000.

Weibel, Ernst K.: *See*—
Hadvary, Paul; Hochuli, Erich; Kupfer, Ernst; Lengsfeld, Hans; and Weibel, Ernst K., 4,598,089, Cl. 514-449.000.

Weihsmann, Peter R., to Franklin Electric Co., Inc. Electric motor mount. 4,597,555, Cl. 248-672.000.

Weil, Roger M.: *See*—
Amon, Albert; and Weil, Roger M., 4,597,793, Cl. 106-21.000.

Weill, Linda. Foam paint set. 4,597,997, Cl. 427-288.000.

Weinert, Friedrich. Cigar cartridge with a self igniting cigar. 4,597,397, Cl. 131-351.000.

Weis, Philip J.; Cook, Richard; Kaminski, David C.; and Smith, James E., to Dana Corporation. Power takeoff speed control assembly. 4,597,301, Cl. 74-15.860.

Weisman, Joe: *See*—
Yarbrough, Charles J.; Strachan, Alan F.; and Weisman, Joe, 4,598,288, Cl. 340-825.340.

Weller, Gerhard: *See*—
Wondra, Arthur; Weller, Gerhard; and Ulrich, Alfred, 4,597,627, Cl. 339-196.00M.

Wells, Gregory J., to Varian Associates, Inc. Method and device for on-column injection of a liquid sample into small diameter columns. 4,597,421, Cl. 141-5.000.

Welter, Jean-Pierre: *See*—
Legille, Edouard; Mailliet, Pierre; Loutsch, Jeannot; and Welter, Jean-Pierre, 4,597,694, Cl. 406-129.000.

Wendt, H.: *See*—
Kiessling, Rainer; Plzak, Voitech; and Wendt, H., 4,597,841, Cl. 204-115.000.

Wenker, Wayne B., to Eaton Corporation. Hydraulic gerotor motor and parking brake for use therein. 4,597,476, Cl. 192-3.00R.

Wenzel, Jorg, to Haacon Hebetechnik GmbH. Lifting and depositing device for portable containers, e.g., containers, shelters, superstructure replacements parts or the like. 4,597,561, Cl. 254-45.000.

Werner, Frank: *See*—
Zeitler, Gerhard; Werner, Frank; Bittner, Gerhard; Baumann, Karl-Heinz; Roeber, Artur; Metzinger, Lothar; Ohlinger, Rainer; and Zettler, Hans D., 4,597,927, Cl. 264-85.000.

Werner & Pfleiderer: *See*—
Lambertus, Friedrich, 4,597,870, Cl. 210-341.000.

Wernimont, T. August. Multiple load cell weighing structure. 4,597,460, Cl. 177-211.000.

Wessel, Wolf: *See*—
Buck, Rainer; Wessel, Wolf; and Stumpp, Gerhard, 4,597,265, Cl. 60-602.000.

West Coast Industries, Inc.: *See*—
Hogenhout, Franciscus, 4,597,282, Cl. 72-370.000.

West Point Foundry and Machine Co.: *See*—
Price, Gordon L.; Ruddick, Howard G.; and Cook, Henry R., 4,598,184, Cl. 200-61.180.
Westcott, Gerald R.: *See*—
Carrington, James E.; and Westcott, Gerald R., 4,597,328, Cl. 101-93.130.
Westinghouse Electric Corp.: *See*—
Brill, Bernard A., III; Junker, Warren R.; White, John K.; Rana, Iftikhar A.; Bevilacqua, Bruce W.; Cooper, Frank W., Jr.; and Taszarek, Bruce J., 4,597,294, Cl. 73-623.000.
Heyne, Carl J.; Tomasic, Nicholas A.; and Wu, Jiing-Liang, 4,598,263, Cl. 335-14.000.
Isenberg, Arnold O., 4,597,170, Cl. 29-623.500.
Kemeny, George A., 4,598,332, Cl. 361-58.000.
Rossing, Barry R.; and Zymboly, Gregory E., 4,598,028, Cl. 429-30.000.
Westmont, Inc.: *See*—
Durant, Will G., 4,597,510, Cl. 222-195.000.
Westvaco Corporation: *See*—
Gendron, Wilfred H.; and Knapp, Frank T., 4,597,591, Cl. 283-1.00B.
Schilling, Peter, 4,597,799, Cl. 106-277.000.
Weyl, Helmut: *See*—
Burkhardt, Joachim; Dreyer, Manfred; Klett, Dittmar; and Weyl, Helmut, 4,597,849, Cl. 204-424.000.
Wheeler, William R.; Kudinar, Rusmin; Kren, George J.; and Clementson, David D., to Tencor Instruments. Wafer handling apparatus. 4,597,708, Cl. 414-331.000.
Whelan, Michael, to Siemens Corporate Research & Support, Inc. Circuit testing apparatus employing signature analysis. 4,598,401, Cl. 371-25.000.
Whirlpool Corporation: *See*—
Lyman, John B., 4,597,130, Cl. 15-327.00R.
Lyman, John B., 4,597,131, Cl. 15-412.000.
White, John K.: *See*—
Brill, Bernard A., III; Junker, Warren R.; White, John K.; Rana, Iftikhar A.; Bevilacqua, Bruce W.; Cooper, Frank W., Jr.; and Taszarek, Bruce J., 4,597,294, Cl. 73-623.000.
Whitehead, Thomas P.: *See*—
Kricka, Larry J.; Thorpe, Gary H. G. H.; and Whitehead, Thomas P., 4,598,044, Cl. 435-28.000.
Whitlock, Robert R.: *See*—
Ripin, Barrett H.; and Whitlock, Robert R., 4,597,933, Cl. 376-153.000.
Whitney, John K., to Gaymar Industries, Inc. Sequential compression sleeve. 4,597,384, Cl. 128-24.00R.
Whittaker Corporation: *See*—
Pagan, Augustine J., 4,597,688, Cl. 403-265.000.
Whitte, William M.: *See*—
Randall, James C.; and Whitte, William M., 4,598,128, Cl. 525-240.000.
Whittle, Timothy: *See*—
Bourdet, Dominique; and Whittle, Timothy, 4,597,290, Cl. 73-155.000.
Wick, Gerhard, to Akzo NV. Embedding material and process for the production thereof. 4,598,136, Cl. 528-56.000.
Wickersheimer, Jack C.: *See*—
Gaylord, F. David; and Wickersheimer, Jack C., 4,598,219, Cl. 310-87.000.
Widiger, Gary N.: *See*—
Herchen, Stephen R.; and Widiger, Gary N., 4,598,158, Cl. 549-394.000.
Wiegcleben, Adelbert: *See*—
Zaschke, Horst; Vorbrodt, Hans-Matthias; Fuchs, Wilfried; Wiegeleben, Adelbert; and Demus, Dietrich, 4,597,892, Cl. 252-299.610.
Wier, Franz, to TRW Repa GmbH. Belt lock for a safety belt. 4,597,141, Cl. 24-633.000.
Wiesemann, Bruce O. Waste materials filtering apparatus. 4,597,864, Cl. 210-160.000.
Wilfinger, Hans J.: *See*—
Frank, Gerhard; Neubauer, Gerald; Duffner, Paul; and Wilfinger, Hans J., 4,598,058, Cl. 502-183.000.
Wilhelm Hegenscheidt Gesellschaft mbH: *See*—
Dombrowski, Theodor, 4,597,143, Cl. 29-27.00R.
Wilke, Raud A., to Husco International. Cross line relief valve mechanism. 4,597,410, Cl. 137-491.000.
Wilke, Rudolf; and Friedrichs, Bernd. Door hardware. 4,597,600, Cl. 292-336.300.
Willetts, Elwood. Low profile intermodal transport system. 4,597,337, Cl. 105-4.00R.
Williames, Geoffrey A., to Geoff. Williames (Aust.) Pty. Ltd. Pyrethrum harvesting machines. 4,597,252, Cl. 56-130.000.
Williams, Frank A., Jr.: *See*—
Logsdon, Gary L.; Scheevel, Mark R.; and Williams, Frank A., Jr., 4,598,361, Cl. 364-200.000.
Williams, Gary H.: *See*—
Keogh, Michael J.; and Williams, Gary H., 4,598,116, Cl. 524-398.000.
Williams International Corporation: *See*—
Balsley, Rollin B.; and Morrill, Daniel J., 4,597,260, Cl. 60-39.827.
Williams, Robert C., III; and Unruh, N. Bruce. Method and apparatus for cleaning upholstery. 4,597,124, Cl. 8-158.000.
Williams, Robert J. W.: *See*—
VanHooser, William B.; and Williams, Robert J. W., 4,597,782, Cl. 55-378.000.
Wilmot, Kenneth, to Neotechnic Engineering Limited. Aerosol valves. 4,597,512, Cl. 222-402.200.
Wilson, Bryce H.: *See*—
Mozley, Robert M.; and Wilson, Bryce H., 4,597,505, Cl. 220-89.00A.
Wilson, Colleen R.: *See*—
Berkovich, Semyon; Wilson, Colleen R.; and Walter, Chris J., 4,598,411, Cl. 375-27.000.
Wilson, John H.: *See*—
Gum, Peter H.; Levin, Arthur L.; Smith, Ronald M.; and Wilson, John H., 4,598,364, Cl. 364-300.000.
Wilson, Richard F., to Wean United, Inc. Rotary notcher for a joined metallic strip. 4,597,521, Cl. 228-160.000.
Wingspread Corporation: *See*—
Jones, Paul, Jr., 4,597,125, Cl. 12-142.00F.
Winkler & Dunnebier Maschinenfabrik und Eisengiesserei GmbH & Co. KG: *See*—
Heyden, Gunter, 4,597,317, Cl. 83-346.000.
Wissmann, Michael; and Nickel, Hans, to Stihl, Andreas. Fuel injection apparatus for two-stroke engines. 4,597,371, Cl. 123-495.000.
Witco Corporation: *See*—
Eliades, Theo I., 4,597,880, Cl. 252-33.400.
Witt, August F.: *See*—
Jasinski, Thomas J.; and Witt, August F., 4,597,949, Cl. 422-249.000.
Witt, Edward H., to Justrite Manufacturing Company. Non-metallic container for flammable fluid and method. 4,597,504, Cl. 220-88.00R.
Wittersheim, Adam; and Much, Gunter, to Goldwell GmbH, Chemische Fabrik H. F. Dotter. Apparatus for applying cosmetic preparations. 4,597,683, Cl. 401-4.000.
Wlodkowski, Henry W., to Coppus Engineering Corporation. Apparatus for lubricating a bearing assembly. 4,597,679, Cl. 384-462.000.
Wojcik, Thaddeus: *See*—
Schoenthaler, David; and Wojcik, Thaddeus, 4,597,420, Cl. 141-2.000.
Wolf, Robert A. Method and apparatus for forming gauze pads. 4,597,748, Cl. 493-29.000.
Wolfe, Henry S. Toy apparatus simulating hunting or combat. 4,597,574, Cl. 273-85.00F.
Wolowski, Eckard; and Tamm, Hans-Friedrich, to Ruhrkohle Aktiengesellschaft. Process for the utilization of waste waters in the hydrogenation of coal. 4,597,851, Cl. 208-400.000.
Wondra, Arthur; Weller, Gerhard; and Ulrich, Alfred, to Siemens Aktiengesellschaft. Multiple plug. 4,597,627, Cl. 339-196.00M.
Wong, Andrew C., to International Standard Electric Corporation. Radar or sonar detection system. 4,598,293, Cl. 343-17.20R.
Wonsowicz, Casimir J.; and Canfield, Glenn R., to Burroughs Corporation. Method of depositing silicon films with reduced structural defects. 4,597,989, Cl. 427-99.000.
Woodall, Jerry M.: *See*—
Freeouf, John L.; Jackson, Thomas N.; Oelhafen, Peter; Pettit, George D.; and Woodall, Jerry M., 4,597,825, Cl. 156-643.000.
Woodward, Fred E.; and Hudson, Alice P. Iodine surface active compositions. 4,597,975, Cl. 424-150.000.
Woodworth, George K., to International Business Machines Corporation. High power direct current switching circuit. 4,598,330, Cl. 361-13.000.
Woolington, John C.; and Chenoweth, James A., to Mattel, Inc. Record engraving apparatus. 4,597,700, Cl. 409-292.000.
World Energy Systems, Inc.: *See*—
Ware, Charles H.; Rose, Leslie C.; and Allen, Joseph C., 4,597,441, Cl. 166-261.000.
Woweries, Uwe: *See*—
Roller, Hermann; Hack, Joachim; Woweries, Uwe; Lehner, August; Grau, Werner; Nagel, Peter; and Falk, Roland, 4,597,990, Cl. 427-130.000.
Wozniak, Robert J.: *See*—
Fertig, Glenn H.; and Wozniak, Robert J., 4,598,201, Cl. 250-343.000.
Wrathall, James A.: *See*—
Ergun, Sabri; Schaleger, Larry L.; Wrathall, James A.; and Yaghoubzadeh, Nasser, 4,597,832, Cl. 162-234.000.
Wright, Douglas C., to Mineral Deposits Limited. Spiral separator. 4,597,861, Cl. 209-459.000.
Wright, Howard J.; Leonard, David P.; and Etzell, Roger A., to Glasurit America, Inc. Coating composition containing cross-linked microparticles. 4,598,111, Cl. 524-40.000.
Wright, John A.: *See*—
Grellmann, H. Erwin; Jones, Keith E.; and Wright, John A., 4,598,334, Cl. 361-290.000.
Wright-Malta Corporation: *See*—
Coffman, John A., 4,597,772, Cl. 48-111.000.
Wu, Jiing-Liang: *See*—
Heyne, Carl J.; Tomasic, Nicholas A.; and Wu, Jiing-Liang, 4,598,263, Cl. 335-14.000.
Wu, Wen-Pao: *See*—
Krutchen, Charles M.; and Wu, Wen-Pao, 4,598,098, Cl. 521-59.000.
Krutchen, Charles M.; and Wu, Wen-Pao, 4,598,100, Cl. 521-81.000.
Krutchen, Charles M.; and Wu, Wen-Pao, 4,598,101, Cl. 521-81.000.
Krutchen, Charles M.; and Wu, Wen-Pao, 4,598,104, Cl. 521-139.000.
Wurtman, Richard J.; and Maher, Timothy J., to Massachusetts Institute of Technology. Method and composition for enhancing the

effect of indirect-acting sympathomimetic amines. 4,598,094, Cl. 514-561.000.

Wuthrich, Paul; Daigle, Lyman R.; and Cozzolino, Gerald, to Timex Corporation. Electronic circuit board for a timepiece. 4,598,337, Cl. 361-401.000.

X-Ten Corporation: *See—*
DeWitt, Nicklas R., 4,597,701, Cl. 410-84.000.

Xerox Corporation: *See—*
Chiang, Anne; and Johnson, Noble M., 4,598,305, Cl. 357-23.700.
Frangesh, Thomas P., 4,598,328, Cl. 360-97.000.
Huggins, Raymond W., 4,597,570, Cl. 271-98.000.
Redding, Thomas P.; and Gray, H. William, 4,597,571, Cl. 271-150.000.

Yaegashi, Takashi: *See—*
Fujii, Setsuro; Sato, Takuo; Kawamura, Hiroyuki; Yaegashi, Takashi; Kurumi, Masateru; and Aoyama, Takuo, 4,598,077, Cl. 514-233.000.

Yagasaki, Akio: *See—*
Watanabe, Masaki; Yagasaki, Akio; Murayama, Toru; and Yonekura, Kazuya, 4,597,931, Cl. 264-129.000.

Yaghoubzadeh, Nasser: *See—*
Ergun, Sabri; Schaleger, Larry L.; Wrathall, James A.; and Yaghoubzadeh, Nasser, 4,597,832, Cl. 162-234.000.

Yagi, Takeo: *See—*
Daigou, Yuzuru; and Yagi, Takeo, 4,597,642, Cl. 350-486.000.

Yamada Chemical Co. Ltd: *See—*
Fujisaki, Hideaki; Nieda, Seiichi; and Tsunemitsu, Katsuhiko, 4,598,150, Cl. 546-152.000.

Yamada, Hiromichi: *See—*
Umetani, Keiji; Suzuki, Atsushi; Nakagawa, Manabu; Yoshida, Minoru; Kawaguchi, Fumio; Yamada, Hiromichi; and Koike, Kouichi, 4,598,203, Cl. 250-366.000.

Yamada, Junichi: *See—*
Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, 4,597,879, Cl. 252-8.55D.

Yamada, Kozo, to Honda Giken Kogyo Kabushiki Kaisha. Air intake apparatus for vehicle. 4,597,466, Cl. 180-225.000.

Yamada, Naohiro: *See—*
Wada, Kiyoshi; Takeda, Hitoshi; Shibata, Hiroki; Toda, Atsushi; Yokoyama, Nobumi; and Yamada, Naohiro, 4,598,237, Cl. 318-16.000.

Yamada, Shunichi: *See—*
Mochida, Shigeru; Yamada, Shunichi; and Hamanaka, Toshiyuki, 4,598,054, Cl. 501-112.000.

Yamada, Yoshihisa: *See—*
Oine, Toyonari; Sugano, Hiroshi; Yamada, Yoshihisa; Yamaguchi, Totaro; and Ohshima, Satoshi, 4,598,075, Cl. 514-203.000.
Oine, Toyonari; Sugano, Hiroshi; Yamada, Yoshihisa; Yamaguchi, Totaro; and Ohshima, Satoshi, 4,598,154, Cl. 548-194.000.

Yamaguchi, Totaro: *See—*
Oine, Toyonari; Sugano, Hiroshi; Yamada, Yoshihisa; Yamaguchi, Totaro; and Ohshima, Satoshi, 4,598,075, Cl. 514-203.000.
Oine, Toyonari; Sugano, Hiroshi; Yamada, Yoshihisa; Yamaguchi, Totaro; and Ohshima, Satoshi, 4,598,154, Cl. 548-194.000.

Yamakawa, Akira; and Kamijo, Eiji, to Sumitomo Electric Industries, Ltd. Ceramic compacts. 4,598,053, Cl. 501-104.000.

Yamakoshi, Ken-ichi; and Shimazu, Hideaki, to Kabushiki Kaisha Copal Takeda Medical Kenyusho. Arterial pressure measuring apparatus. 4,597,393, Cl. 128-677.000.

Yamamoto, Toshimasa; and Ando, Takayuki, to Kabushiki Kaisha Takai-Rika-Denki-Seisakusho. Webbing retractor. 4,597,546, Cl. 242-107.40A.

Yamamuro, Sigeaki: *See—*
Tanaka, Yoshikazu; Yamamuro, Sigeaki; Abo, Keiju; Kumura, Haruyoshi; Hirano, Hiroyuki; and Morimoto, Yoshiro, 4,597,308, Cl. 74-866.000.

Yamashita, Keitaro, to Hitachi Metals Ltd. Magnet roll assembly. 4,597,661, Cl. 355-3.0DD.

Yamashita, Yoshimi, to Fuji Photo Film Co., Ltd. Folding type camera. 4,597,656, Cl. 354-193.000.

Yamauchi, Koki: *See—*
Sakurai, Mikio; Yamauchi, Koki; and Suzuki, Shuji, 4,597,937, Cl. 376-441.000.

Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Method of making photoelectric conversion device. 4,597,161, Cl. 29-572.000.

Yamazaki, Shunpei. Printing member for electrostatic photocopying. 4,598,031, Cl. 430-57.000.

Yanagida, Kazuhiro: *See—*
Moriya, Kunihiko; Tate, Kazuhito; Muroga, Goro; and Yanagida, Kazuhiro, 4,597,853, Cl. 208-22.000.

Yanagisawa, Hiroshi: *See—*
Tung, Min-Hsiung G.; and Yanagisawa, Hiroshi, 4,598,283, Cl. 340-731.000.

Yang, Robert K.: *See—*
Sharma, Shri C.; and Yang, Robert K., 4,597,970, Cl. 426-5.000.

Yankee Noodle Dandy, Inc.: *See—*
Cardullo, Mario; Caraluzzi, Mark; and Schildbach, Peter, 4,597,325, Cl. 99-404.000.

Yano, Yasuhiro: *See—*
Ohta, Tokuya; Yano, Yasuhiro; Matsufuji, Yohji; Haruta, Masahiro; and Eida, Tsuyoshi, 4,597,794, Cl. 106-20.000.

Yarbrough, Charles J.; Strachan, Alan F.; and Weisman, Joe, to Codart, Inc. Apparatus for controlling the reception of transmitted programs. 4,598,288, Cl. 340-825.340.

Yarwood, Richard J.: *See—*
Maxfield, Howard C.; Phillips, Anthony J.; and Yarwood, Richard J., 4,597,969, Cl. 424-157.000.

Yasuda, Kenji: *See—*
Itamoto, Shigeru; Suzuki, Kiyoshi; and Yasuda, Kenji, 4,597,569, Cl. 269-21.000.

Yasuhara, Seishi, to Nissan Motor Company, Limited. Fuel cutoff apparatus for fuel injection pump for diesel engine. 4,597,369, Cl. 123-458.000.

Yasuoka, Akimasa; and Otobe, Yutaka, to Honda Giken Kogyo Kabushiki Kaisha. Method for controlling fuel supply to an internal combustion engine after termination of fuel cut. 4,597,370, Cl. 123-493.000.

Yatabe, Yasuo: *See—*
Kusuhara, Rei; Otsubo, Koichi; and Yatabe, Yasuo, 4,597,819, Cl. 156-345.000.

Yatsunami, Kazuharu: *See—*
Matsui, Seiji; Yatsunami, Kazuharu; Miyashita, Tsuneo; and Sakamoto, Noboru, 4,597,790, Cl. 75-3.000.

Yee, Edward M.: *See—*
Scapple, Robert Y.; Peters, John W.; Linder, Jacques F.; and Yee, Edward M., 4,597,986, Cl. 427-53.100.

Yeh, An-I: *See—*
Berg, Lloyd; and Yeh, An-I, 4,597,834, Cl. 203-51.000.

Yield Engineering Systems, Inc.: *See—*
Moffat, William, 4,597,736, Cl. 432-26.000.

Yim, Nelson C., to SmithKline Beckman Corporation. β-indolylalanyl or β-indolylglycinyl vasopressin antagonists. 4,597,901, Cl. 530-328.000.

Yohn, Robert L.: *See—*
Hill, Jeffrey A.; Yohn, Robert L.; Modi, Ashok L.; and Newton, Kevin H., 4,597,330, Cl. 101-93.010.

Yokogawa Hokushin Electric Corporation: *See—*
Goto, Shigeru; and Sekiguchi, Toshio, 4,597,295, Cl. 73-861.170.

Yokoyama, Nobumi: *See—*
Wada, Kiyoshi; Takeda, Hitoshi; Shibata, Hiroki; Toda, Atsushi; Yokoyama, Nobumi; and Yamada, Naohiro, 4,598,237, Cl. 318-16.000.

Yokoyama, Nobuo, to Nippon Oil Company, Ltd. Method for surface treatment of powdery and granular material stored in open air. 4,598,019, Cl. 428-407.000.

Yokoyama, Shigeki: *See—*
Aoyama, Takeo; Magara, Syoji; Yokoyama, Shigeki; Kamei, Tadashi; and Uehara, Mikio, 4,597,818, Cl. 156-308.200.

Yonekura, Kazuya: *See—*
Watanabe, Masaki; Yagasaki, Akio; Murayama, Toru; and Yonekura, Kazuya, 4,597,931, Cl. 264-129.000.

Yonezawa, Keitaro, to Aioi Seiki K.K. Transferring device for dies and the like. 4,597,709, Cl. 414-401.000.

York, Earl D.; Knepper, Jay C.; and Forgac, John M. Static mixer retorting of oil shale. 4,597,852, Cl. 208-427.000.

Yoshida Kogyo K. K.: *See—*
Ofusa, Masaatsu, 4,597,418, Cl. 139-384.00B.

Yoshida, Minoru: *See—*
Umetani, Keiji; Suzuki, Atsushi; Nakagawa, Manabu; Yoshida, Minoru; Kawaguchi, Fumio; Yamada, Hiromichi; and Koike, Kouichi, 4,598,203, Cl. 250-366.000.

Yoshida, Tadahiro, to Nitsuko Limited. Binary digital data signal reproducing circuit in digital data transmission system. 4,598,412, Cl. 375-94.000.

Yoshida, Toshihiko: *See—*
Tanaka, Kazunobu; Matsuda, Akihisa; and Yoshida, Toshihiko, 4,598,304, Cl. 357-4.000.

Yoshii, Shin: *See—*
Nishimura, Tamio; Toku, Hiroshige; Yoshii, Shin; Fukuyasu, Harumi; Matsumoto, Kuniomi; Kazuno, Youzo; and Watanabe, Tetsuro, 4,598,095, Cl. 514-632.000.

Yoshinaga, Sadao, to Prince Industrial Development Co., Ltd. Burner device. 4,597,732, Cl. 431-255.000.

Yoshino, Hisakazu; and Takagi, Kazutoshi, to Tokyo Kogaku Kikai Kabushiki Kaisha. Specular microscope. 4,597,650, Cl. 351-214.000.

Yoshioka, Susumu; Matsuo, Nobuo; Meguri, Nobuyasu; Murakami, Tadashi; Ishibashi, Yasushi; Matsuda, Kenichi; Suzuka, Teruo; Fukase, Satoshi; and Ohse, Hidetaka, to Processing Research Association of Residual Oil. Process for fluidized catalytic cracking of heavy oils and production of hydrogen. 4,597,856, Cl. 208-112.000.

Yoshitomi Pharmaceutical Industries, Ltd.: *See—*
Tahara, Tetsuya; Arita, Masafumi; and Kuroda, Tsuyoshi, 4,598,093, Cl. 514-538.000.

Yoshitsugu, Noritada; Sugiura, Motonobu; and Matsuzaki, Yutaka, to Toyota Jidosha Kabushiki Kaisha. Seatbelt system. 4,597,587, Cl. 280-807.000.

Yoshiura, Shoichiro; and Ikeda, Haruyoshi, to Sharp Kabushiki Kaisha. Electrophotographic copying machine of automatic magnification/reduction-controllable type. 4,597,663, Cl. 355-14.00R.

Young, Colin G., to Emco Wheaton International Limited. Fuel control system for gaseous fueled engines. 4,597,364, Cl. 123-27.0GE.

Yu, Ju M., to RCA Corporation. Ramp comparator arrangement useful in an on-screen channel indicator system of a television receiver. 4,598,317, Cl. 358-192.100.

Zaghi, Hooshmand; and Kodama, Roy K., to Solartron Electronics, Inc. Fluid pressure transmitting diaphragm assembly and method of manufacture. 4,597,151, Cl. 29-421.00R.

Zair, Eliezer: *See—*
Raif, Joshua; and Zair, Eliezer, 4,597,380, Cl. 128-6.000.

Zaschke, Horst; Vorbrodt, Hans-Matthias; Fuchs, Wilfried; Wiegeleben, Adelbert; and Demus, Dietrich, to VEB Werk fuer Fernsehelektronik im VEB Kombinat Mikroelektronik. Liquid crystalline 2-substituted-5-(1-alkyl-piperid-4-yl)-1,3-dioxanes. 4,597,892, Cl. 252-299.610.

Zaydel, Wieslaw S., to General Motors Corporation. Method for mounting plastic body panel. 4,597,153, Cl. 29-434.000.

Zborovsky, Jury L.: *See*—
Efimov, Andrei S.; Melnik, Igor M.; Tkachuk, Jury V.; Tronko, Nikolai D.; Efimova, Elena K.; Obrosova, Irina G.; Gordienko, Vadim M.; Kaminsky, Leonid A.; Staninets, Vasily I.; Zborovsky, Jury L.; Mokhort, Nikolai A.; and Kirichek, Lora M., 4,598,081, Cl. 514-296.000.

Zehle, Gunter: *See*—
Bottcher, Regina; Juhnke, Hubert; Kulawick, Gabriele; Zehle, Gunter; and Zosche, Helmut, 4,597,980, Cl. 426-568.000.

Zeitler, Gerhard; Werner, Frank; Bittner, Gerhard; Baumann, Karl-Heinz; Roeber, Artur; Metzinger, Lothar; Ohlinger, Rainer; and Zettler, Hans D., to BASF Aktiengesellschaft. Two-stage process for the preparation of thermoplastic polyurethane elastomers. 4,597,927, Cl. 264-85.000.

Zelinka, Richard J.; Itakura, Keiichi; Sims, Carl W.; and Kaplan, Bruce E., to Systec Inc. General purpose gene synthesizer. 4,598,049, Cl. 435-287.000.

Zenith Electronics Corporation: *See*—
Hendrickson, Melvin C., 4,598,313, Cl. 358-124.000.
Skerlos, Peter C.; and Strammello, Peter, Jr., 4,598,425, Cl. 455-180.000.

Zettler, Hans D.: *See*—
Zeitler, Gerhard; Werner, Frank; Bittner, Gerhard; Baumann, Karl-Heinz; Roeber, Artur; Metzinger, Lothar; Ohlinger, Rainer; and Zettler, Hans D., 4,597,927, Cl. 264-85.000.

Ziegenbein, Botho, to Brown, Boveri & Cie Aktiengesellschaft. Thermal insulation. 4,598,005, Cl. 428-69.000.

Ziemelis, Maris J.; and Roth, Charles A., to Aplin & Barrett, Ltd.; and Dow Corning Corporation. Cationic polydiorganosiloxanes for treating proteinaceous substrates. 4,597,964, Cl. 424-70.000.

Zilog, Inc.: *See*—
Tsang, Juine-Kai, 4,597,163, Cl. 29-576.00B.

Zodiac: *See*—
Eymard, Michel, 4,597,113, Cl. 4-488.000.

Zolton, Raymond P.; and Nasser, Jennifer A., to Ortho Diagnostic Systems, Inc. Histidine stabilized immunoglobulin and method of preparation. 4,597,966, Cl. 424-85.000.

Zosche, Helmut: *See*—
Bottcher, Regina; Juhnke, Hubert; Kulawick, Gabriele; Zehle, Gunter; and Zosche, Helmut, 4,597,980, Cl. 426-568.000.

Zudal, Andrew: *See*—
Mayhall, Riley H., Jr.; and Zudal, Andrew, 4,597,516, Cl. 226-154.000.

Zymboly, Gregory E.: *See*—
Rossing, Barry R.; and Zymboly, Gregory E., 4,598,028, Cl. 429-30.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 1ST DAY OF JULY, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Baker, Stephen R.; Jamieson, William B.; and Ross, William J., to Lilly Industries Limited. Aurone derivatives. Re. 32,196, Cl. 514-382.000.

Eastman Kodak Company: *See*—
Herz, Arthur H., Re. 32,195, Cl. 430-445.000.

Herz, Arthur H., to Eastman Kodak Company. Silver halide emulsions containing aromatic latent image stabilizing compounds. Re. 32,195, Cl. 430-445.000.

Jamieson, William B.: *See*—
Baker, Stephen R.; Jamieson, William B.; and Ross, William J., Re. 32,196, Cl. 514-382.000.

Lilly Industries Limited: *See*—
Baker, Stephen R.; Jamieson, William B.; and Ross, William J., Re. 32,196, Cl. 514-382.000.

Ross, William J.: *See*—
Baker, Stephen R.; Jamieson, William B.; and Ross, William J., Re. 32,196, Cl. 514-382.000.

LIST OF DESIGN PATENTEES

Abrams, Julian M., to Plessey Overseas Limited. Telephone stand with dialing means. 284,470, 7-1-86, Cl. D14-60.000.

Aksjeselskapet Jotul: *See*—
Heger, Niels-Erik, 284,501, Cl. D23-97.000.

Allen, James H., to 'totes', incorporated. Expandable bag. 284,425, 7-1-86, Cl. D3-71.000.

American Commercial, Incorporated: *See*—
Levien, Robin, 284,438, Cl. D7-23.000.

American Meter Company: *See*—
Porter, Norman, 284,456, Cl. D10-103.000.

AMP Incorporated: *See*—
Crowley, Daniel J.; and English, James M., 284,466, Cl. D13-24.000.

Ando, Teturo, to Kabushikikaisha Taikodenki Seisakusho. Telephone. 284,469, 7-1-86, Cl. D14-58.000.

Arvin Industries, Inc.: *See*—
Bowman, John; and Otterbein, Roy T., 284,505, Cl. D23-139.000.

AT&T Technologies, Inc.: *See*—
Felix, Christian J.; Genaro, Donald M.; and Sylvester, Gordon E., 284,471, Cl. D14-63.000.

Atlas Corporation: *See*—
McPoyle, Francis M., 284,514, Cl. D25-80.000.

Baba, Haruo; Kurosu, Teisuke; Ohta, Fumiharu; Takenaka, Kazumasa; and Watanabe, Satoshi, to Matsushita Electric Industrial Co., Ltd. Telephone answering machine. 284,467, 7-1-86, Cl. D14-52.000.

Baumgarten, Rolf, to Heinrich Baumgarten KG Eisen; and Blechwarenfabrik. Handle for cooking utensils. 284,444, 7-1-86, Cl. D7-393.000.

Beard, Dennis R.; Jensen, Donald E.; Juhl, James L.; and Taylor, Mark W. Vehicle turn signal light. 284,515, 7-1-86, Cl. D26-30.000.

Bellis, Robert D.: *See*—
Tod, Timothy W.; Tod, Roger J.; and Bellis, Robert D., 284,485, Cl. D20-9.000.

Benjamin, Alice: *See*—
Way, John R., 284,441, Cl. D7-106.000.

Berry, Richard D., Jr., to Design Institute America, Inc. Table. 284,431, 7-1-86, Cl. D6-479.000.

Blechwarenfabrik: *See*—
Baumgarten, Rolf, 284,444, Cl. D7-393.000.

Bolgert, Edwin F.; and Kolada, Paul P., to Kohler Co. Plumbing fitting handle. 284,500, 7-1-86, Cl. D23-29.000.

Boschen, Fred; and Boschen, Henry, to Carrier King, Inc. Raisable plow hitch assembly. 284,476, 7-1-86, Cl. D15-28.000.

Boschen, Henry: *See*—
Boschen, Fred; and Boschen, Henry, 284,476, Cl. D15-28.000.

Boundy, Bruce K., to Westinghouse Electric Corp. Furniture foot or similar article. 284,434, 7-1-86, Cl. D6-498.000.

Bowman, John; and Otterbein, Roy T., to Arvin Industries, Inc. Two-stage evaporative cooler or similar article. 284,505, 7-1-86, Cl. D23-139.000.

Bredeweg, Robert A., to John Thomas Batts, Inc. Hook attachment boss for a garment hanger. 284,427, 7-1-86, Cl. D6-328.000.

Bridgestone Tire Company Limited: *See*—
Kojima, Hiroshi; Kawajiri, Junichi; and Hayakawa, Toshio, 284,460, Cl. D12-140.000.

British Gas Corporation: *See*—
Stoves, Derek; and Hatley, John E., 284,498, Cl. D23-21.000.

Budd Company, The: *See*—
Epley, Joseph P., 284,465, Cl. D13-24.000.

Carignan, Roger G.: *See*—
Pratt, Clyde R.; Carignan, Roger G.; Martinez, David M.; and Schiffman, Michael L., 284,510, Cl. D24-27.000.

Carrier King, Inc.: *See*—
Boschen, Fred; and Boschen, Henry, 284,476, Cl. D15-28.000.

Cesaroni, William C.: *See*—
Gremonprez, Dan E.; and Cesaroni, William C., 284,454, Cl. D10-40.000.

Chan, Chun-Man, to Space Lab (H.K.) Enterprises Limited. Combined knife, fork, and spoon set. 284,442, 7-1-86, Cl. D7-148.000.

Chen, J. H., to Yeong Chin Machinery Industries Co., Ltd. Turret milling machine. 284,477, 7-1-86, Cl. D15-131.000.

Citizen Watch Co., Ltd.: *See*—
Ohtsu, Yutaka, 284,473, Cl. D14-77.000.

Close, Oliver S. Figurine. 284,458, 7-1-86, Cl. D11-158.000.

Cloverline, Inc.: *See*—
Leopoldi, Norbert, 284,507, Cl. D24-17.000.

Coin Controls Limited: *See*—
Tod, Timothy W.; Tod, Roger J.; and Bellis, Robert D., 284,485, Cl. D20-9.000.

Conti, Rino: *See*—
Zieff, Mark P.; and Conti, Rino, 284,437, Cl. D7-16.000.

Cooper, William J.; and Spady, Richard J., to International Telephone & Telegraph Corp. Instrument casing for graphic recorder or the like. 284,455, 7-1-86, Cl. D10-46.000.

Cosden Technology, Inc.: *See*—
Fortuna, Vincent E., 284,451, Cl. D9-353.000.

Cox, Terence A.; Johnson, Paul M.; and Horton, Philip C., to Swish Products Limited. Drapery rod support bracket. 284,448, 7-1-86, Cl. D8-363.000.

Crowley, Daniel J.; and English, James M., to AMP Incorporated. Locking clip pin extender. 284,466, 7-1-86, Cl. D13-24.000.

Cubic Western Data: *See*—
Smith, Billy G., 284,511, Cl. D25-51.000.
Smith, Billy G., 284,512, Cl. D25-51.000.

Daiwa Seiko, Inc.: *See*—
Kaneko, Kyoichi; and Nakamura, Hideo, 284,496, Cl. D22-25.000.

Dart Industries Inc.: *See*—
Gremonprez, Dan E.; and Cesaroni, William C., 284,454, Cl. D10-40.000.
Zieff, Mark P.; and Conti, Rino, 284,437, Cl. D7-16.000.
Zieff, Mark P., 284,440, Cl. D7-105.000.

de Bascher, Xavier, to Jungle Jap. Font of type. 284,479, 7-1-86, Cl. D18-24.000.

Design Institute America, Inc.: *See*—
Berry, Richard D., Jr., 284,431, Cl. D6-479.000.

Diener, Lawrence R.: *See*—
Ventimiglia, Joseph J.; and Diener, Lawrence R., 284,439, Cl. D9-70.000.

Dorelli, John A. Combined toy tractor, trailer and bulldozer. 284,489, 7-1-86, Cl. D21-134.000.

Draddy, Roy C. Holder for a rule book and score card. 284,481, 7-1-86, Cl. D19-26.000.

Drag Specialties, Inc.: *See*—
Stahel, Alwin J., 284,461, Cl. D12-185.000.

Duke, Tommy F. Novelty amusement eyeglasses. 284,495, 7-1-86, Cl. D21-240.000.

Dushek, Charles D.: *See*—
Perkins, Nancy J.; Dushek, Charles D.; and Hennen, Roy E., 284,463, Cl. D13-9.000.

Dyer, Richard A. Extension ladder shelf. 284,513, 7-1-86, Cl. D25-68.000.

Enatsu, Ikuya. Tonometer. 284,508, 7-1-86, Cl. D24-21.000.

English, James M.: *See*—
Crowley, Daniel J.; and English, James M., 284,466, Cl. D13-24.000.

Epley, Joseph P., to Budd Company, The. Lockable housing for securing electrical plugs. 284,465, 7-1-86, Cl. D13-24.000.

Felix, Christian J.; Genaro, Donald M.; and Sylvester, Gordon E., to AT&T Technologies, Inc. Telephone handset. 284,471, 7-1-86, Cl. D14-63.000.

Ford Motor Company: *See*—
Gransden, Ronald G., 284,486, Cl. D20-42.000.

Fortuna, Vincent E., to Cosden Technology, Inc. Packaging container. 284,451, 7-1-86, Cl. D9-353.000.

Gabriel, Edwin Z. Ring-lug terminal with attached magnet. 284,464, 7-1-86, Cl. D13-24.000.

Garde, Patria P. Combined cane and seat unit. 284,429, 7-1-86, Cl. D6-368.000.

Genaro, Donald M.: *See*—
Felix, Christian J.; Genaro, Donald M.; and Sylvester, Gordon E., 284,471, Cl. D14-63.000.

Georges Gotlib, Inc.: *See*—
Gotlib, Georges; and Goldman, Robert, 284,424, Cl. D3-39.000.

Globe-Union Inc.: *See*—
Perkins, Nancy J.; Dushek, Charles D.; and Hennen, Roy E., 284,463, Cl. D13-9.000.

Goldman, Robert: *See*—
Gotlib, Georges; and Goldman, Robert, 284,424, Cl. D3-39.000.

Gotlib, Georges; and Goldman, Robert, to Georges Gotlib, Inc. Vanity case. 284,424, 7-1-86, Cl. D3-39.000.

Gransden, Ronald G., to Ford Motor Company. Display sign. 284,486, 7-1-86, Cl. D20-42.000.

Greenlaw, John W.; Schlueter, Gary; and Kettlitz, Karsten, to Greenlaw, John W. Rear view mirror for attachment to a crash helmet. 284,462, 7-1-86, Cl. D12-189.000.

Gremonprez, Dan E.; and Cesaroni, William C., to Dart Industries Inc. Timer. 284,454, 7-1-86, Cl. D10-40.000.

Gutknecht, Walter, to Papierfavrik Balsthal. Wall housing for an aerosol spray dispenser. 284,506, 7-1-86, Cl. D23-150.000.

H. W. Hull & Sons, Ic.: *See*—
Hull, Laura L., 284,432, Cl. D6-494.000.

H. W. Hull & Sons, Inc.: *See*—
Hull, Laura L., 284,433, Cl. D6-494.000.

Haas, Ulrich J., to Optyl Eyewear Fashion International Corp. Eyeglass frame. 284,478, 7-1-86, Cl. D16-102.000.

Haker, Floyd H. Mag card activated coupon label dispenser. 284,484, 7-1-86, Cl. D20-2.000.

Hatley, John E.: *See*—
Stoves, Derek; and Hatley, John E., 284,498, Cl. D23-21.000.

Hayakawa, Toshio: *See*—
Kojima, Hiroshi; Kawajiri, Junichi; and Hayakawa, Toshio, 284,460, Cl. D12-140.000.

Heger, Niels-Erik, to Aksjeselskapet Jotul. Fire-place. 284,501, 7-1-86, Cl. D23-97.000.

Heinrich Baumgarten KG Eisen: *See*—
Baumgarten, Rolf, 284,444, Cl. D7-393.000.

Hennen, Roy E.: *See*—
Perkins, Nancy J.; Dushek, Charles D.; and Hennen, Roy E., 284,463, Cl. D13-9.000.

Hodges, Janice D. Pillow. 284,436, 7-1-86, Cl. D6-601.000.

Horton, Philip C.: *See*—
Cox, Terence A.; Johnson, Paul M.; and Horton, Philip C., 284,448, Cl. D8-363.000.

Hull, Laura L., to H. W. Hull & Sons, Ic. Furniture panel. 284,432, 7-1-86, Cl. D6-494.000.

Hull, Laura L., to H. W. Hull & Sons, Inc. Furniture panel. 284,433, 7-1-86, Cl. D6-494.000.

IBM International Business Machines Corporation: *See*—
Manabe, Yoshiyuki, 284,475, Cl. D14-107.000.

Imanishi Kinzoku Kogyo Kabushiki Kaisha (Imarflex Mfg. Co., Ltd.): *See*—
Okamoto, Kenzo; and Sakai, Koichi, 284,504, Cl. D23-122.000.

International Telephone & Telegraph Corp.: *See*—
Cooper, William J.; and Spady, Richard J., 284,455, Cl. D10-46.000.

Isaberg AB: *See*—
Rosenblad, Lars-Goran, 284,446, Cl. D8-49.000.

Jensen, Donald E.: *See*—
Beard, Dennis R.; Jensen, Donald E.; Juhl, James L.; and Taylor, Mark W., 284,515, Cl. D26-30.000.

John Thomas Batts, Inc.: *See*—
Bredeweg, Robert A., 284,427, Cl. D6-328.000.

Johnson, Lanny L. Surgical staple. 284,509, 7-1-86, Cl. D24-29.000.

Johnson, Paul M.: *See*—
Cox, Terence A.; Johnson, Paul M.; and Horton, Philip C., 284,448, Cl. D8-363.000.

Juhl, James L.: *See*—
Beard, Dennis R.; Jensen, Donald E.; Juhl, James L.; and Taylor, Mark W., 284,515, Cl. D26-30.000.

Jungle Jap: *See*—
de Bascher, Xavier, 284,479, Cl. D18-24.000.

Kabushikikaisha Taikodenki Seisakusho: *See*—
Ando, Teturo, 284,469, Cl. D14-58.000.

Kaneko, Kyoichi; and Nakamura, Hideo, to Daiwa Seiko, Inc. Fishing reel clutch lever. 284,496, 7-1-86, Cl. D22-25.000.

Kawajiri, Junichi: *See*—
Kojima, Hiroshi; Kawajiri, Junichi; and Hayakawa, Toshio, 284,460, Cl. D12-140.000.

Kettlitz, Karsten: *See*—
Greenlaw, John W.; Schlueter, Gary; and Kettlitz, Karsten, 284,462, Cl. D12-189.000.

King, David G. Ball. 284,493, 7-1-86, Cl. D21-204.000.

Kohler Co.: *See*—
Bolgert, Edwin F.; and Kolada, Paul P., 284,500, Cl. D23-29.000.

Kojima, Hiroshi; Kawajiri, Junichi; and Hayakawa, Toshio, to Bridgestone Tire Company Limited. Vehicle tire. 284,460, 7-1-86, Cl. D12-140.000.

Kolada, Paul P.: *See*—
Bolgert, Edwin F.; and Kolada, Paul P., 284,500, Cl. D23-29.000.

Kouzin, Ohno, to Takara Co., Ltd. Reconfigurable toy vehicle. 284,490, 7-1-86, Cl. D21-136.000.

Kurosu, Teisuke: *See*—
Baba, Haruo; Kurosu, Teisuke; Ohta, Fumiharu; Takenaka, Kazumasa; and Watanabe, Satoshi, 284,467, Cl. D14-52.000.

L & D Enterprise, Inc.: *See*—
Pomaville, Louis, 284,422, Cl. D3-38.000.

Leopoldi, Norbert, to Cloverline, Inc. Medical percussion hammer or the like. 284,507, 7-1-86, Cl. D24-17.000.

Levien, Robin, to American Commercial, Incorporated. Saucer. 284,438, 7-1-86, Cl. D7-23.000.

Lindell, Anders, to Telefonaktiebolaget LM Ericsson. Wall anchor. 284,449, 7-1-86, Cl. D8-385.000.

Manabe, Yoshiyuki, to IBM International Business Machines Corporation. Image scanner. 284,475, 7-1-86, Cl. D14-107.000.

Martinez, David M.: *See*—
Pratt, Clyde R.; Carignan, Roger G.; Martinez, David M.; and Schiffman, Michael L., 284,510, Cl. D24-27.000.

Matras, Michael. Telephone. 284,468, 7-1-86, Cl. D14-53.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Baba, Haruo; Kurosu, Teisuke; Ohta, Fumiharu; Takenaka, Kazumasa; and Watanabe, Satoshi, 284,467, Cl. D14-52.000.

McCallum, John A. Rod and reel case. 284,423, 7-1-86, Cl. D3-38.000.

McKay, Benjamin E. Pouring lip. 284,452, 7-1-86, Cl. D9-434.000.

McPoyle, Francis M., to Atlas Corporation. Revetment block. 284,514, 7-1-86, Cl. D25-80.000.

Mervau, Incorporated: *See*—
Mervau, Terry A., 284,457, Cl. D10-124.000.

Mervau, Terry A., to Mervau, Incorporated. Dial and crown unit for a clock. 284,457, 7-1-86, Cl. D10-124.000.

Millroy, John P. Ornamental design for an artificial fishing strip. 284,497, 7-1-86, Cl. D22-27.000.

Morris, George B. Belt buckle holder. 284,426, 7-1-86, Cl. D6-317.000.

Nakamura, Hideo: *See*—
Kaneko, Kyoichi; and Nakamura, Hideo, 284,496, Cl. D22-25.000.

Nakamura, Kazuharu, to Toyotomi Kogyo Co., Ltd. Oil-fired space heater. 284,503, 7-1-86, Cl. D23-121.000.

Nakane, Shigeru, to Takara Co., Ltd. Combined wrist watch and toy vehicle. 284,453, 7-1-86, Cl. D10-33.000.

Nakatani, Takeshi; and Yokoyama, Nagakazu, to NEC Corporation. Digital display pager. 284,472, 7-1-86, Cl. D14-68.000.

NEC Corporation: *See*—
Nakatani, Takeshi; and Yokoyama, Nagakazu, 284,472, Cl. D14-68.000.

Nissan Motor Co., Ltd.: *See*—
Suzuki, Kiyoshi; and Osawa, Norio, 284,450, Cl. D9-332.000.

Ohno, Kouzin, to Takara Co., Ltd. Reconfigurable toy vehicle. 284,491, 7-1-86, Cl. D21-136.000.

Ohta, Fumiharu: *See*—
Baba, Haruo; Kurosu, Teisuke; Ohta, Fumiharu; Takenaka, Kazumasa; and Watanabe, Satoshi, 284,467, Cl. D14-52.000.

Ohtsu, Yutaka, to Citizen Watch Co., Ltd. Portable television set. 284,473, 7-1-86, Cl. D14-77.000.

Okamoto, Kenzo; and Sakai, Koichi, to Imanishi Kinzoku Kogyo Kabushiki Kaisha (Imarflex Mfg. Co., Ltd.). Stove. 284,504, 7-1-86, Cl. D23-122.000.

Optyl Eyewear Fashion International Corp.: *See*—
Haas, Ulrich J., 284,478, Cl. D16-102.000.

Osawa, Norio: *See*—
Suzuki, Kiyoshi; and Osawa, Norio, 284,450, Cl. D9-332.000.

Otterbein, Roy T.: *See*—
Bowman, John; and Otterbein, Roy T., 284,505, Cl. D23-139.000.

Papierfavrik Balsthal: *See*—
Gutknecht, Walter, 284,506, Cl. D23-150.000.

Parlour, Neville W. Barbecue. 284,443, 7-1-86, Cl. D7-334.000.

Pensa, Inc.: *See*—
Tong, James K., 284,420, Cl. D2-320.000.

Perkins, Nancy J.; Dushek, Charles D.; and Hennen, Roy E., to Globe-Union Inc. Battery container. 284,463, 7-1-86, Cl. D13-9.000.

Plessey Overseas Limited: *See*—
Abrams, Julian M., 284,470, Cl. D14-60.000.

Pomaville, Louis, to L & D Enterprise, Inc. Fly box. 284,422, 7-1-86, Cl. D3-38.000.

Porter, Norman, to American Meter Company. Fluid meter electronic flow corrector module cover. 284,456, 7-1-86, Cl. D10-103.000.

Pratt, Clyde R.; Carignan, Roger G.; Martinez, David M.; and Schiffman, Michael L., to Techmedica, Inc. Surgical retractor. 284,510, 7-1-86, Cl. D24-27.000.

Pratt, Richard J. Aural/visual signalling instrument. 284,487, 7-1-86, Cl. D21-100.000.

Price Pfister, Inc.: *See*—
Yost, Holly K., 284,499, Cl. D23-25.000.

Quaker Oats Company, The: *See*—
Smith, M. Allyson, 284,488, Cl. D21-109.000.

Raftery, William B., to Steelcase, Inc. Seat. 284,428, 7-1-86, Cl. D6-349.000.

Rosenblad, Lars-Goran, to Isaberg AB. Tacker. 284,446, 7-1-86, Cl. D8-49.000.

Sakai, Koichi: *See*—
Okamoto, Kenzo; and Sakai, Koichi, 284,504, Cl. D23-122.000.

Satterfield, Roy E. Display case. 284,430, 7-1-86, Cl. D6-450.000.

Sawada, Masaji, to Sharp Corporation. Portable computer. 284,474, 7-1-86, Cl. D14-100.000.
Schiffman, Michael L.: *See—*
Pratt, Clyde R.; Carignan, Roger G.; Martinez, David M.; and Schiffman, Michael L., 284,510, Cl. D24-27.000.
Schlueter, Gary: *See—*
Greenlaw, John W.; Schlueter, Gary; and Kettlitz, Karsten, 284,462, Cl. D12-189.000.
Sharp Corporation: *See—*
Sawada, Masaji, 284,474, Cl. D14-100.000.
Shimano Industrial Company Limited: *See—*
Shimizu, Koji, 284,459, Cl. D12-125.000.
Shimizu, Koji, to Shimano Industrial Company Limited. Pedal for a bicycle. 284,459, 7-1-86, Cl. D12-125.000.
Sieck, Rodney W., to Therm'x Corporation. Catalytic space heater. 284,502, 7-1-86, Cl. D23-110.000.
Sinclair & Rush, Inc.: *See—*
Ventimiglia, Joseph J.; and Diener, Lawrence R., 284,439, Cl. D9-70.000.
Sirco International Corp.: *See—*
Siris, Burt J., 284,421, Cl. D3-30.100.
Siris, Burt J., to Sirco International Corp. Container for storing personal effects while swimming or bathing. 284,421, 7-1-86, Cl. D3-30.100.
Smith, Billy G., to Cubic Western Data. Fare collection gate. 284,511, 7-1-86, Cl. D25-51.000.
Smith, Billy G., to Cubic Western Data. Fare processing gate unit. 284,512, 7-1-86, Cl. D25-51.000.
Smith, M. Allyson, to Quaker Oats Company, The. Toy change dispenser. 284,488, 7-1-86, Cl. D21-109.000.
Space Lab (H.K.) Enterprises Limited: *See—*
Chan, Chun-Man, 284,442, Cl. D7-148.000.
Spady, Richard J.: *See—*
Cooper, William J.; and Spady, Richard J., 284,455, Cl. D10-46.000.
Stahel, Alwin J., to Drag Specialties, Inc. Motorcycle mudflap. 284,461, 7-1-86, Cl. D12-185.000.
Steelcase, Inc.: *See—*
Raftery, William B., 284,428, Cl. D6-349.000.
Stoves, Derek; and Hatley, John E., to British Gas Corporation. Gas governor module. 284,498, 7-1-86, Cl. D23-21.000.
Sun, Jam, to Sun Office Products, Inc. Combined vertical sorter and letter tray. 284,482, 7-1-86, Cl. D19-90.000.
Sun Office Products, Inc.: *See—*
Sun, Jam, 284,482, Cl. D19-90.000.
Suzuki, Kiyoshi; and Osawa, Norio, to Nissan Motor Co., Ltd. Packing box. 284,450, 7-1-86, Cl. D9-332.000.
Swish Products Limited: *See—*
Cox, Terence A.; Johnson, Paul M.; and Horton, Philip C., 284,448, Cl. D8-363.000.
Sylvester, Gordon E.: *See—*
Felix, Christian J.; Genaro, Donald M.; and Sylvester, Gordon E., 284,471, Cl. D14-63.000.
Takara Co., Ltd.: *See—*
Kouzin, Ohno, 284,490, Cl. D21-136.000.
Nakane, Shigeru, 284,453, Cl. D10-33.000.
Ohno, Kouzin, 284,491, Cl. D21-136.000.
Takenaka, Kazumasa: *See—*
Baba, Haruo; Kurosu, Teisuke; Ohta, Fumiharu; Takenaka, Kazumasa; and Watanabe, Satoshi, 284,467, Cl. D14-52.000.
Taylor, Mark W.: *See—*
Beard, Dennis R.; Jensen, Donald E.; Juhl, James L.; and Taylor, Mark W., 284,515, Cl. D26-30.000.
Techmedica, Inc.: *See—*
Pratt, Clyde R.; Carignan, Roger G.; Martinez, David M.; and Schiffman, Michael L., 284,510, Cl. D24-27.000.
Telefonaktiebolaget LM Ericsson: *See—*
Lindell, Anders, 284,449, Cl. D8-385.000.
Therm'x Corporation: *See—*
Sieck, Rodney W., 284,502, Cl. D23-110.000.
Tod, Roger J.: *See—*
Tod, Timothy W.; Tod, Roger J.; and Bellis, Robert D., 284,485, Cl. D20-9.000.
Tod, Timothy W.; Tod, Roger J.; and Bellis, Robert D., to Coin Controls Limited. Housing part for a coin dispenser. 284,485, 7-1-86, Cl. D20-9.000.
Tong, James K., to Pensa, Inc. Shoe sole. 284,420, 7-1-86, Cl. D2-320.000.
'totes', incorporated: *See—*
Allen, James H., 284,425, Cl. D3-71.000.
Toyotomi Kogyo Co., Ltd.: *See—*
Nakamura, Kazuharu, 284,503, Cl. D23-121.000.
Udagawa, Yoshio. Toy trackway. 284,492, 7-1-86, Cl. D21-143.000.
Ventimiglia, Joseph J.; and Diener, Lawrence R., to Sinclair & Rush, Inc. Beverage container holder. 284,439, 7-1-86, Cl. D9-70.000.
Wallgren, Scott. Wall calendar. 284,480, 7-1-86, Cl. D19-20.000.
Watanabe, Satoshi: *See—*
Baba, Haruo; Kurosu, Teisuke; Ohta, Fumiharu; Takenaka, Kazumasa; and Watanabe, Satoshi, 284,467, Cl. D14-52.000.
Way, John R., to Way, John R.; and Benjamin, Alice. Hot dog slitter. 284,441, 7-1-86, Cl. D7-106.000.
Webster, Hugh J. Steering column lock. 284,447, 7-1-86, Cl. D8-331.000.
Westinghouse Electric Corp.: *See—*
Boundy, Bruce K., 284,434, Cl. D6-498.000.
Wickesberg, Alfred W. Warmer for a food dispenser spout. 284,445, 7-1-86, Cl. D7-397.000.
Williamson, Paul J. Golf instructional mat or the like. 284,494, 7-1-86, Cl. D21-234.000.
Yang, Dwight J. Note pad holder. 284,483, 7-1-86, Cl. D19-91.000.
Yeong Chin Machinery Industries Co., Ltd.: *See—*
Chen, J. H., 284,477, Cl. D15-131.000.
Yokoyama, Nagakazu: *See—*
Nakatani, Takeshi; and Yokoyama, Nagakazu, 284,472, Cl. D14-68.000.
Yost, Holly K., to Price Pfister, Inc. Faucet. 284,499, 7-1-86, Cl. D23-25.000.
Zelenko, Harry; and Zelenko, Marion. Combined swatch leveling and binding clip. 284,435, 7-1-86, Cl. D6-512.000.
Zelenko, Marion: *See—*
Zelenko, Harry; and Zelenko, Marion, 284,435, Cl. D6-512.000.
Zieff, Mark P.; and Conti, Rino, to Dart Industries Inc. Covered cheese serving tray or the like. 284,437, 7-1-86, Cl. D7-16.000.
Zieff, Mark P., to Dart Industries Inc. Ice tongs or the like. 284,440, 7-1-86, Cl. D7-105.000.

LIST OF PLANT PATENTEES

Buck, Griffith J., to Iowa State University Research Foundation, Inc. Rose plant named Bucblu. 5,756, 7-1-86, Cl. 11.000.

Buck, Griffith J., to Iowa State University Research Foundation, Inc. Geranium plant named Orangeade. 5,757, 7-1-86, Cl. 68.000.

Buck, Griffith J., to Iowa State University Research Foundation, Inc. Geranium plant named Troubadour. 5,758, 7-1-86, Cl. 68.000.

Buck, Griffith J., to Iowa State University Research Foundation, Inc. Geranium plant named La Sevillana. 5,759, 7-1-86, Cl. 68.000.

Iowa State University Research Foundation, Inc.: *See*—
Buck, Griffith J., 5,756, Cl. 11.000.
Buck, Griffith J., 5,757, Cl. 68.000.
Buck, Griffith J., 5,758, Cl. 68.000.
Buck, Griffith J., 5,759, Cl. 68.000.

LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM

STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE 1ST DAY OF JULY, 1986

Adolph, Horst G.; and Sitzmann, Michael E., to United States of America, Navy. 5-aza-3,3,7,7-tetranitrononane-1,9-diols and method of preparation. H78, 7-1-86, Cl. 560-110.000.

American Cyanamid Company: *See*—
Poletto, John F.; and Bernstein, Seymour, H83, Cl. 424-49.000.

Baker, Louis, Jr.: *See*—
Gabor, John D.; Cassulo, John C.; Pedersen, Dean R.; and Baker, Louis, Jr., H91, Cl. 376-280.000.

Bartholet, Michael A.; and Prahl, Marvin E. Magnetic recording disk cartridge. H79, 7-1-86, Cl. 360-133.000.

Bauer, Kevin T.: *See*—
Savioli, Giulio V.; and Bauer, Kevin T., H88, Cl. 42-16.000.

Bernstein, Seymour: *See*—
Poletto, John F.; and Bernstein, Seymour, H83, Cl. 424-49.000.

Bumgardner, Jon H., to United States of America, Navy. Real-time polar controlled video processor. H84, 7-1-86, Cl. 358-140.000.

Cassulo, John C.: *See*—
Gabor, John D.; Cassulo, John C.; Pedersen, Dean R.; and Baker, Louis, Jr., H91, Cl. 376-280.000.

Cotterman, Bruce W., to United States of America, Army. Instructional polariscope. H76, 7-1-86, Cl. 356-33.000.

Coulter, George A.: *See*—
Kingery, Charles N.; and Coulter, George A., H86, Cl. 73-12.000.

Dittrich, William A.; and Stanton, Roger, to United States of America, Army. Composite gun barrels. H82, 7-1-86, Cl. 42-76.00A.

Gabor, John D.; Cassulo, John C.; Pedersen, Dean R.; and Baker, Louis, Jr., to United States of America, Energy. Safety apparatus for nuclear reactor to prevent structural damage from overheating by core debris. H91, 7-1-86, Cl. 376-280.000.

Harris, Jeffrey L.: *See*—
Matta, Joseph E.; and Harris, Jeffrey L., H93, Cl. 73-56.000.

Harville, Cathy L.; and Williams, Thomas E., to W. R. Grace & Co. Apple juice clarification by using silica hydrogels. H89, 7-1-86, Cl. 426-423.000.

Kingery, Charles N.; and Coulter, George A., to United States of America, Army. Arrangement for counteracting shock tube rarefaction waves. H86, 7-1-86, Cl. 73-12.000.

Koo, Kee P., to United States of America, America. High stability fiber optic magnetic field sensor with enhanced linear range using magnetic feedback nulling. H94, 7-1-86, Cl. 250-227.000.

Kretschmer, Frank F., Jr.; and Lewis, Bernard L., to United States of America, America. Generalized adaptive MTI system. H92, 7-1-86, Cl. 343-7.700.

Kumar, Vijayendra. Stitch-bonded split-film fabric. H90, 7-1-86, Cl. 66-192.000.

Lewis, Bernard L.: *See*—
Kretschmer, Frank F., Jr.; and Lewis, Bernard L., H92, Cl. 343-7.700.

Lewis, Joseph C., to United States of America, Air Force. Lightweight cryogenic tank with positive expulsion. H80, 7-1-86, Cl. 222-95.000.

Matta, Joseph E.; and Harris, Jeffrey L., to United States of America, Army. Elongational rheometer. H93, 7-1-86, Cl. 73-56.000.

Moore, William J.: *See*—
Shanabrook, Benjamin V.; and Moore, William J., H95, Cl. 357-30.000.

Niesen, Joseph W.: *See*—
Yao, Shi-Kay; and Niesen, Joseph W., H77, Cl. 350-96.120.

Osborne, William I.: *See*—
Szabo, Louis R.; and Osborne, William I., H81, Cl. 346-38.000.

Pedersen, Dean R.: *See*—
Gabor, John D.; Cassulo, John C.; Pedersen, Dean R.; and Baker, Louis, Jr., H91, Cl. 376-280.000.

Poletto, John F.; and Bernstein, Seymour, to American Cyanamid Company. Dental antiplaque agents and inhibitors of connective tissue destruction. H83, 7-1-86, Cl. 424-49.000.

Prahl, Marvin E.: *See*—
Bartholet, Michael A.; and Prahl, Marvin E., H79, Cl. 360-133.000.

Reynolds, George L., to United States of America, Army. One piece ejector/ejector spring for cartridge firing weapons. H87, 7-1-86, Cl. 42-25.000.

Savioli, Giulio V.; and Bauer, Kevin T., to United States of America, Army. Ammunition bolt for a firearm, having improved shaped locking lugs thereon. H88, 7-1-86, Cl. 42-16.000.

Shanabrook, Benjamin V.; and Moore, William J., to United States of America, America. Heterojunction D^{-}(or A^{+}) millimeter and submillimeter wave detector. H95, 7-1-86, Cl. 357-30.000.

Shortsleeve, Michael J. Bile tube assembly. H85, 7-1-86, Cl. 604-284.000.

Sitzmann, Michael E.: *See*—
Adolph, Horst G.; and Sitzmann, Michael E., H78, Cl. 560-110.000.

Stanton, Roger: *See*—
Dittrich, William A.; and Stanton, Roger, H82, Cl. 42-76.00A.

Szabo, Louis R.; and Osborne, William I., to United States of America, Army. Projectile guidance recording system. H81, 7-1-86, Cl. 346-38.000.

United States of America
Air Force: *See*—
Lewis, Joseph C., H80, Cl. 222-95.000.
America: *See*—
Koo, Kee P., H94, Cl. 250-227.000.
Kretschmer, Frank F., Jr.; and Lewis, Bernard L., H92, Cl. 343-7.700.
Shanabrook, Benjamin V.; and Moore, William J., H95, Cl. 357-30.000.
Army: *See*—
Cotterman, Bruce W., H76, Cl. 356-33.000.
Dittrich, William A.; and Stanton, Roger, H82, Cl. 42-76.00A.
Kingery, Charles N.; and Coulter, George A., H86, Cl. 73-12.000.
Matta, Joseph E.; and Harris, Jeffrey L., H93, Cl. 73-56.000.
Reynolds, George L., H87, Cl. 42-25.000.
Savioli, Giulio V.; and Bauer, Kevin T., H88, Cl. 42-16.000.
Szabo, Louis R.; and Osborne, William I., H81, Cl. 346-38.000.
Yao, Shi-Kay; and Niesen, Joseph W., H77, Cl. 350-96.120.
Energy: *See*—
Gabor, John D.; Cassulo, John C.; Pedersen, Dean R.; and Baker, Louis, Jr., H91, Cl. 376-280.000.
Navy: *See*—
Adolph, Horst G.; and Sitzmann, Michael E., H78, Cl. 560-110.000.
Bumgardner, Jon H., H84, Cl. 358-140.000.

W. R. Grace & Co.: *See*—
Harville, Cathy L.; and Williams, Thomas E., H89, Cl. 426-423.000.

Williams, Thomas E.: *See*—
Harville, Cathy L.; and Williams, Thomas E., H89, Cl. 426-423.000.

Yao, Shi-Kay; and Niesen, Joseph W., to United States of America, Army. Low loss, single-mode planar waveguide. H77, 7-1-86, Cl. 350-96.120.

LIST OF DEFENSIVE PUBLICATIONS

-PPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 1ST DAY OF JULY, 1986

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Mair, Alexander D. Method to improve acidulation quality of Idaho phosphate rock. T106,801, 7-1-86, Cl. 423-167.000.

CLASSIFICATION OF PATENTS

ISSUED JULY 1, 1986

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

168 4,597,108
304 4,597,109
408 4,597,110

CLASS 4

287 4,597,112
420.4 4,597,111
488 4,597,113
662 4,597,114

CLASS 5

13 4,597,115
99 A 4,597,116
181 4,597,117
246 4,597,118
431 4,597,119
451 4,597,120
494 4,597,121
503 4,597,122

CLASS 7

138 4,597,123

CLASS 8

158 4,597,124

CLASS 12

142 F 4,597,125

CLASS 15

3 4,597,126
24 4,597,127
53 AB 4,597,128
250.16 4,597,129
327 R 4,597,130
412 4,597,131

CLASS 17

23 4,597,132
24 4,597,133
32 4,597,134
45 4,597,135
52 4,597,136

CLASS 23

299 4,597,768

CLASS 24

33 P 4,597,137
265 B 4,597,138
546 4,597,139
569 4,597,140
633 4,597,141

CLASS 28

269 4,597,142

CLASS 29

27 R 4,597,143
40 4,597,144
51 4,597,145
160.6 4,597,146
213 R 4,597,147
230 4,597,148
235 4,597,149
407 4,597,150
421 R 4,597,151
433 4,597,152
434 4,597,153
525 4,597,154
564 4,597,155
564.4 4,597,156
564.8 4,597,157
566.3 4,597,158
571 4,597,159
4,597,160
572 4,597,161
574 4,597,162
576 B 4,597,163
4,597,165
576 W 4,597,164
580 4,597,166
590 4,597,167
596 4,597,168
605 4,597,169
623.5 4,597,170
727 4,597,171
736 4,597,172
741 4,597,173
4,597,174
827 4,597,175
829 4,597,176
878 4,597,177

CLASS 30

138 4,597,178
233 4,597,179
366 4,597,180
475 4,597,181

CLASS 33

1 M 4,597,182
125 W 4,597,183
143 F 4,597,184
185 R 4,597,185
392 4,597,186
552 4,597,187

CLASS 34

5 4,597,188
38 4,597,189
57 A 4,597,190
60 4,597,191
66 4,597,192
224 4,597,193

CLASS 36

7.1 R 4,597,194
28 4,597,195
44 4,597,196
56 4,597,197
100 4,597,198
114 4,597,199

CLASS 37

63 4,597,200
64 4,597,201
232 4,597,202
241 4,597,203
4,597,205
285 4,597,204

CLASS 40

1.5 4,597,206
20 R 4,597,207
301 4,597,208
447 4,597,209
542 4,597,210

CLASS 42

1 S 4,597,211
70 E 4,597,212
90 4,597,213

CLASS 43

9 4,597,214
19.2 4,597,215
43.2 4,597,216
125 4,597,217
131 4,597,218

CLASS 44

1 SR 4,597,769
51 4,597,770

CLASS 47

1.5 4,597,219
27 4,597,220
66 4,597,221
87 4,597,222

CLASS 48

77 4,597,771
111 4,597,772
197 R 4,597,773
4,597,774
4,597,775
4,597,776

CLASS 49

199 4,597,224
352 4,597,223

CLASS 51

92 ND 4,597,226
168 4,597,227
209 R 4,597,225
235 4,597,228

CLASS 52

1 4,597,229
233 4,597,230
239 4,597,231
304 4,597,232
334 4,597,233
478 4,597,234
509 4,597,235
564 4,597,236
601 4,597,237
606 4,597,238
644 4,597,239

CLASS 53

57 4,597,240
116 4,597,241
426 4,597,242
430 4,597,243
434 4,597,244
510 4,597,245
542 4,597,246
557 4,597,247

CLASS 55

16 4,597,777
18 4,597,778
32 4,597,779
119 4,597,780
126 4,597,781
378 4,597,782
4,597,783
4,597,784

CLASS 56

1 4,597,248
4,597,249
13.4 4,597,253
16.4 4,597,250
17.6 4,597,251
130 4,597,252
341 4,597,254

CLASS 57

62 4,597,255

CLASS 60

39.05 4,597,256
39.091 4,597,259
39.12 4,597,257
39.31 4,597,258
39.827 4,597,260
223 4,597,261
274 4,597,262
534 4,597,263
602 4,597,264
4,597,265

CLASS 62

26 4,597,788
46 4,597,266
55.5 4,597,267
93 4,597,268
138 4,597,270
286 4,597,269
294 4,597,271
304 4,597,272

CLASS 65

2 4,597,785
4,597,786
3.12 4,597,787
106 4,597,789

CLASS 70

30 4,597,273
455 4,597,274

CLASS 72

21 4,597,275
49 4,597,276
182 4,597,277
187 4,597,278
306 4,597,279
315 4,597,280
318 4,597,281
370 4,597,282
378 4,597,283
407 4,597,284

CLASS 73

29 4,597,285
146.5 4,597,286
151 4,597,289
155 4,597,290
188 4,597,287
384 4,597,288
432 AD 4,597,291
599 4,597,292
606 4,597,293
623 4,597,294
861.17 4,597,295
862.33 4,597,296
862.48 4,597,297
863.71 4,597,298
864.81 4,597,299

CLASS 74

5 R 4,597,300
15.86 4,597,301
57 4,597,302
89.15 4,597,303
329 4,597,304
424.8 A 4,597,305
473 P 4,597,306
512 4,597,307
575 4,597,309
665 GA 4,597,310
694 4,597,311
695 4,597,312
861 4,597,313
866 4,597,308

CLASS 75

3 4,597,790
118 R 4,597,791
249 4,597,792

CLASS 81

3.2 4,597,314
129.5 4,597,315

CLASS 83

156 4,597,316
346 4,597,317

CLASS 84

1.22 4,597,318

CLASS 91

27 4,597,319
465 4,597,320
470 4,597,321

CLASS 92

60 4,597,322

CLASS 98

2.11 4,597,323
42.16 4,597,324

CLASS 99

404 4,597,325

CLASS 100

50 4,597,326
295 4,597,327

CLASS 101

93.01 4,597,330
93.13 4,597,328
110 4,597,331
363 4,597,329

CLASS 102

505 4,597,332
518 4,597,333

CLASS 104

37 4,597,334
118 4,597,335
130 4,597,336

CLASS 105

4 R 4,597,337

CLASS 106

20 4,597,794
21 4,597,793
4,597,795
74 4,597,796
194 4,597,797
203 4,597,798
264 4,597,800
277 4,597,799
308 Q 4,597,801
315 4,597,802

CLASS 108

51.1 4,597,338
4,597,339

CLASS 109

45 4,597,340

CLASS 110

173 A 4,597,341
347 4,597,342

CLASS 111

2 4,597,343

CLASS 112

262.3 4,597,344

CLASS 114

20 R 4,597,345
39 4,597,346
106 4,597,347
140 4,597,348
144 A 4,597,349
230 4,597,350
4,597,351
254 4,597,352
270 4,597,353
343 4,597,354
345 4,597,355
363 4,597,356

CLASS 116

22 A 4,597,357

CLASS 118

24 4,597,358

CLASS 119

1 4,597,359
3 4,597,360
52 B 4,597,361

CLASS 122

4 D 4,597,362

CLASS 123

3 4,597,363
27 GE 4,597,364
90.6 4,597,365
146.5 A 4,597,366
188 AA 4,597,367
339 4,597,368
458 4,597,369
493 4,597,370
495 4,597,371
572 4,597,372
630 4,597,373

CLASS 126

19 R 4,597,374
117 4,597,375
121 4,597,376
438 4,597,377
450 4,597,378

CLASS 128

1 R 4,597,379
6 4,597,380
4,597,381
17 4,597,382
18 4,597,383
24 R 4,597,384
78 4,597,386
80 H 4,597,395
201.27 4,597,387
303.1 4,597,388
328 4,597,389
340 4,597,390
361 4,597,391
637 4,597,392
677 4,597,393
751 4,597,385
777 4,597,394

CLASS 131

327 4,597,396
351 4,597,397

CLASS 132

92 R 4,597,398

CLASS 134

10 4,597,803
184 4,597,399

CLASS 135

18 4,597,400
90 4,597,401
102 4,597,402

CLASS 136

213 4,598,163
249 4,598,164

CLASS 137

1 4,597,403
14 4,597,404
113 4,597,405
115 4,597,406
331 4,597,407
461 4,597,408
491 4,597,409
493.8 4,597,410
606 4,597,411
614.04 4,597,412
625.25 4,597,413
875 4,597,414
899.4 4,597,415
4,597,416

CLASS 139

76 4,597,417
384 B 4,597,418

CLASS 140

124 4,597,419

CLASS 141

2 4,597,420
5 4,597,421
85 4,597,422
330 4,597,423

CLASS 144

1 C 4,597,424

CLASS 148

1.5 4,597,804
4,597,805
6.15 Z 4,597,806
16.5 4,597,807
20.3 4,597,808
404 4,597,809

CLASS 149

15 4,597,810
19.92 4,597,811

CLASS 150

55 4,597,425

CLASS 182

379.5 4,597,426

CLASS 156

63 4,597,812
79 4,597,813
219 4,597,814
235 4,597,815
263 4,597,816
280 4,597,817
308.2 4,597,818
345 4,597,819
353 4,597,820
500 4,597,821
612 4,597,822
622 4,597,823
643 4,597,824
4,597,825
4,597,826
4,597,827
4,597,828
644 4,597,829

CLASS 160

107 4,597,427
188 4,597,428
236 4,597,429
269 4,597,430

CLASS 162

32 4,597,830
135 4,597,831
234 4,597,832

CLASS 164

253 4,597,431
444 4,597,432

CLASS 165

4 4,597,433
10 4,597,434
76 4,597,436
80.5 4,597,435

CLASS 166

79 4,597,437
105 4,597,438
163 4,597,439
250 4,597,440

261 4,597,441
272 4,597,442
4,597,443
302 4,597,444
319 4,597,445
322 4,597,446
347 4,597,447
348 4,597,448
373 4,597,449

CLASS 169

50 4,597,450
61 4,597,451

CLASS 172

574 4,597,452

CLASS 173

171 4,597,453

CLASS 174

36 4,598,165
68.5 4,598,166
4,598,167
115 4,598,168

CLASS 175

61 4,597,454
228 4,597,455
371 4,597,456

CLASS 177

25 4,597,457
164 4,597,458
210 R 4,597,459
211 4,597,460

CLASS 178

22.04 4,598,169
22.08 4,598,170

CLASS 179

6.14 4,598,171
16 AA 4,598,172
18 FA 4,598,173
84 C 4,598,179
84 VF 4,598,174
100 C 4,598,175
103 4,598,176
107 E 4,598,177
115.5 VC 4,598,178

CLASS 180

90 4,597,461
140 4,597,462
165 4,597,463
176 4,597,465
225 4,597,466
248 4,597,467
255 4,597,468

CLASS 181

114 4,597,464
129 4,597,469
141 4,597,470

CLASS 182

136 4,597,471
178 4,597,472
187 4,597,473

CLASS 188

24.21 4,597,474
378 4,597,475

CLASS 191

35 4,598,180

CLASS 192

0.052 4,597,482
3 R 4,597,476
8 R 4,597,477
18 R 4,597,479
43.1 4,597,478
54 4,597,480
58 A 4,597,481
59 4,597,483
70.15 4,597,484
70.27 4,597,485
107 R 4,597,486

CLASS 194

209 4,597,487

CLASS 198

339.1 4,597,488
468.2 4,597,489
468.5 4,597,490
642 4,597,491
852 4,597,492

CLASS 200

5 A 4,598,181
43.11 4,598,182
50 A 4,598,183
61.18 4,598,184
80 R 4,598,185
144 R 4,598,186
147 R 4,598,187
148 A 4,598,188

CLASS 203

49 4,597,833
51 4,597,834
89 4,597,835

CLASS 204

4 4,597,836
14.1 4,597,837
44.2 4,597,838
67 4,597,839
4,597,840
115 4,597,841
130 4,597,842
165 4,597,843
192 C 4,597,844
206 4,597,845
290 F 4,597,846
298 4,597,847
418 4,597,848
424 4,597,849
426 4,597,850

CLASS 206

363 4,597,493
390 4,597,494

CLASS 208

22 4,597,853
58 4,597,854
61 4,597,855
112 4,597,856
400 4,597,851
427 4,597,852

CLASS 209

3.3 4,597,495
166 4,597,857
4,597,858
211 4,597,859
223 A 4,597,860
459 4,597,861

CLASS 210

106 4,597,862
117 4,597,863
160 4,597,864
179 4,597,865
198.2 4,597,866
218 4,597,867
232 4,597,868
4,597,869
341 4,597,870
456 4,597,871
605 4,597,872
649 4,597,873
708 4,597,874
710 4,597,875
748 4,597,876
750 4,597,877

CLASS 211

70.6 4,597,496

CLASS 212

147 4,597,497
189 4,597,498

CLASS 213

50.5 4,597,499

CLASS 215

256 4,597,500
330 4,597,501

CLASS 219

69 W 4,598,189
4,598,190
121 PW 4,598,191
201 4,598,192
215 4,598,193
464 4,598,194
497 4,598,195

CLASS 220

67 4,597,502
83 4,597,503
88 R 4,597,504
89 A 4,597,505

CLASS 221

6 4,597,506

CLASS 222

16 4,597,507
83 4,597,508
129 4,597,509
195 4,597,510
380 4,597,511
402.2 4,597,512
478 4,597,513
600 4,597,514

CLASS 223

43 4,597,515

CLASS 226

154 4,597,516

CLASS 227

8 4,597,517
128 4,597,518

CLASS 228

102 4,597,519
111 4,597,520
160 4,597,521
179 4,597,522

CLASS 229

40 4,597,523

CLASS 235

454 4,598,196

CLASS 239

14 4,597,524
28 4,597,525
123 4,597,526
381 4,597,528
394 4,597,527
430 4,597,529
452 4,597,530
650 4,597,531
675 4,597,532
701 4,597,533
704 4,597,534

CLASS 241

30 4,597,535
62 4,597,536
79.1 4,597,537
86.1 4,597,538

CLASS 242

18 PW 4,597,539
35.5 A 4,597,540
55 4,597,541
64 4,597,542
107.2 4,597,545
107.4 A 4,597,546
107.4 B 4,597,543
4,597,544
191 4,597,547

CLASS 244

104 FP 4,597,548
118.5 4,597,549

CLASS 248

146 4,597,550
314 4,597,551
429 4,597,552
440 4,597,553
542 4,597,554
672 4,597,555

CLASS 250

205 4,598,197
4,598,198
222.1 4,598,199
327.2 4,598,200
343 4,598,201
366 4,598,202
4,598,203
374 4,598,204
458.1 4,598,205
484.1 4,598,207
495.1 4,598,206
515.1 4,598,208

CLASS 251

58 4,597,556
63.4 4,597,557
129.15 4,597,558
144 4,597,559
163 4,597,560

CLASS 252

8.5 M 4,597,878
8.55 D 4,597,879
33.4 4,597,880
41 4,597,881
51 4,597,882
70 4,597,883
4,597,884
93 4,597,885
95 4,597,886
106 4,597,887
135 4,597,888
4,597,889
153 4,597,890
299.1 4,597,891
299.61 4,597,892
354 4,597,893
358 4,597,894
392 4,597,895
500 4,597,896
518 4,597,897
529 4,597,898

CLASS 254

45 4,597,561
334 4,597,562

CLASS 260

330.6 4,597,903
351.5 4,597,904
377 4,597,905
401 4,597,906
404 4,597,907
409 4,597,908
550 4,597,914

CLASS 261

29 4,597,915
94 4,597,916
153 4,597,917

CLASS 262

239 B 4,597,902

CLASS 264

2.6 4,597,918
3.6 4,597,924
12 4,597,919
22 4,597,920
23 4,597,921
26 4,597,922
29.4 4,597,923
32 4,597,925
67 4,597,926
85 4,597,927
87 4,597,928
102 4,597,929
115 4,597,930
129 4,597,931
145 4,597,932

CLASS 266

77 4,597,563
274 4,597,564

CLASS 267

64.13 4,597,565
91 4,597,566
140.2 4,597,567
154 4,597,568

CLASS 269

21 4,597,569

CLASS 271

98 4,597,570
150 4,597,571
171 4,597,572
195 4,597,573

CLASS 273

37 4,597,575
73 D 4,597,576
80.1 4,597,577
81 R 4,597,578
85 F 4,597,574
156 4,597,579
418 4,597,580

CLASS 277

12 4,597,581
53 4,597,582
235 B 4,597,583

CLASS 280

6 R 4,597,584
411 C 4,597,585
806 4,597,586
807 4,597,587
808 4,597,588
821 4,597,589

CLASS 281

34 4,597,590

CLASS 283

1 B 4,597,591
75 4,597,592
91 4,597,593

CLASS 285

119 4,597,595
187 4,597,596
196 4,597,597
239 4,597,594

CLASS 290

38 C 4,598,209
43 4,598,210
53 4,598,211

CLASS 292

68 4,597,598
174 4,597,599
336.3 4,597,600

CLASS 293

122 4,597,601

CLASS 294

81.3 4,597,602

CLASS 296

95 C 4,597,608
194 4,597,603

CLASS 297

18 4,597,604
219 4,597,605
422 4,597,606
468 4,597,607

CLASS 299

6 4,597,609

CLASS 303

22 R 4,597,610
116 4,597,611

CLASS 305

51 4,597,612

CLASS 307

3 4,598,212
270 4,598,213
291 4,598,214
355 4,598,215
443 4,598,216
525 4,598,217

CLASS 308

10 4,597,613

CLASS 310

42 4,598,218
87 4,598,219
90 4,598,220
103 4,598,221
198 4,598,222
260 4,598,223
313 R 4,598,224

CLASS 312

42 4,597,614
201 4,597,615
246 4,597,616

CLASS 313

17 4,598,225
341 4,598,226
422 4,598,227
475 4,598,228
493 4,598,229
4,598,230

CLASS 315

111.81 4,598,231
225 4,598,232
366 4,598,233
370 4,598,234
4,598,235
403 4,598,236

CLASS 318

16 4,598,237
282 4,598,238
314 4,598,239
429 4,598,240
439 4,598,241
640 4,598,242

CLASS 323

349 4,598,243
351 4,598,244

CLASS 324

73 PC 4,598,246
73 R 4,598,245
77 R 4,598,247
103 R 4,598,248
158 R 4,598,249
220 4,598,250

CLASS 328

140 4,598,251

CLASS 330

51 4,598,252
253 4,598,253
286 4,598,254
297 4,598,255
302 4,598,256

CLASS 331

2 4,598,257
14 4,598,258
111 4,598,259
135 4,598,260

CLASS 333

195 4,598,261
208 4,598,262

CLASS 335

14 4,598,263
161 4,598,264

CLASS 337

219 4,598,265

CLASS 339

17 CF 4,597,617
65 4,597,618
75 MP 4,597,619
89 R 4,597,620
90 R 4,597,621
95 R 4,597,622
97 P 4,597,623
143 R 4,597,624
176 M 4,597,625
184 M 4,597,626
196 M 4,597,627
275 T 4,597,628

CLASS 340

347 AD 4,598,269
347 DD 4,598,266
4,598,267
4,598,268
347 NT 4,598,270
511 4,598,271
539 4,598,272
4,598,273
550 4,598,274
572 4,598,276
573 4,598,275
604 4,598,277
608 4,598,278
626 4,598,279
631 4,598,280
664 4,598,281
703 4,598,282
731 4,598,283
750 4,598,284
825.06 4,598,286
825.24 4,598,287
825.34 4,598,288
825.5 4,598,285
850 4,598,290
870.34 4,598,289
870.37 4,598,291
973 4,598,292

CLASS 343

17.2 R 4,598,293
17.7 4,598,294
702 4,598,295
730 4,598,296
882 4,598,297

CLASS 346

1.1 4,598,298
75 4,598,299
76 PH 4,598,300
4,598,301
4,598,302
140 R 4,598,303

CLASS 350

1.5 4,597,629
3.83 4,597,630
96.20 4,597,631
96.21 4,597,632
125 4,597,633
144 4,597,634
334 4,597,635
4,597,636
339 F 4,597,637
354 4,597,638
363 4,597,639
405 4,597,640
425 4,597,641
486 4,597,642
507 4,597,643
511 4,597,644
526 4,597,645
529 4,597,646

CLASS 351

133 4,597,647
212 4,597,648
214 4,597,649
4,597,650
243 4,597,651

CLASS 354

7 4,597,652
21 4,597,653
4,597,654
121 4,597,655
193 4,597,656
195.12 4,597,657
275 4,597,658
409 4,597,659

CLASS 355

3 DD 4,597,661
3 SH 4,597,660
14 R 4,597,662
4,597,663
43 4,597,664

CLASS 356

237 4,597,665
338 4,597,666
350 4,597,667
372 4,597,668
401 4,597,669
405 4,597,670

CLASS 357

4 4,598,304
23.7 4,598,305
30 4,598,306
75 4,598,307
81 4,598,308

CLASS 358

11 4,598,309
19 4,598,310
93 4,598,311
118 4,598,312
124 4,598,313
4,598,318
140 4,598,314
149 4,598,315
168 4,598,316
192.1 4,598,317
195.1 4,598,319
213 4,598,320
4,598,321
4,598,322
285 4,598,323
341 4,598,324

CLASS 360

39 4,598,325
40 4,598,326
77 4,598,327
97 4,598,328
130.21 4,598,329

CLASS 361

13 4,598,330
46 4,598,331
58 4,598,332
286 4,598,333
290 4,598,334
314 4,598,335
391 4,598,336
401 4,598,337
435 4,598,338

CLASS 362

72 4,598,339
98 4,598,340
125 4,598,341
213 4,598,342
216 4,598,343
220 4,598,344
233 4,598,345
267 4,598,346
373 4,598,347
390 4,598,348

CLASS 363

8 4,598,349
35 4,598,350
49 4,598,351
69 4,598,352
87 4,598,353

CLASS 364

174 4,598,354
184 4,598,355
200 4,598,356
4,598,357
4,598,358
4,598,359
4,598,360
4,598,361
4,598,362
4,598,363
4,598,365
300 4,598,364
400 4,598,366
408 4,598,367
414 4,598,368
4,598,369
424 4,598,373
424.1 4,598,374
426 4,598,370
431.04 4,598,371
470 4,598,376
472 4,598,377
479 4,598,378
4,598,379
513 4,598,380
518 4,598,372
558 4,598,381
569 4,598,375
757 4,598,382
900 4,598,383
4,598,384
4,598,385

CLASS 365

105 4,598,386
149 4,598,387
200 4,598,388
208 4,598,389
230 4,598,390

CLASS 366

127 4,597,671
186 4,597,672

CLASS 367

25 4,598,391
32 4,598,392

CLASS 368

80 4,597,673
83 4,597,674

CLASS 369

44 4,598,394
46 4,598,393
100 4,598,395

CLASS 370

17 4,598,398
27 4,598,396
55 4,598,399
60 4,598,400
110.1 4,598,397

CLASS 371

25 4,598,401
38 4,598,402
39 4,598,403
49 4,598,404

CLASS 372

12 4,598,405
59 4,598,406
87 4,598,407
89 4,598,409
94 4,598,408

CLASS 374

115 4,597,675

CLASS 375

3 4,598,410
27 4,598,411
94 4,598,412
116 4,598,413

CLASS 376

153 4,597,933
235 4,597,934
353 4,597,935
411 4,597,936
441 4,597,937

CLASS 377

58 4,598,414

CLASS 378

119 4,598,415
168 4,598,416

CLASS 381

67 4,598,417
83 4,598,418

CLASS 382

6 4,598,419
8 4,598,420

CLASS 383

37 4,598,421

CLASS 384

105 4,597,677
114 4,597,676
452 4,597,678
462 4,597,679

CLASS 400

124 4,597,680
488 4,597,681
656 4,597,682

CLASS 401

4 4,597,683
197 4,597,684
199 4,597,685

CLASS 403

11 4,597,686
242 4,597,687
265 4,597,688
322 4,597,689
391 4,597,690

CLASS 404

11 4,597,691
25 4,597,692

CLASS 405

176 4,597,693

CLASS 406

129 4,597,694

CLASS 407

113 4,597,695
114 4,597,696

CLASS 408

61 4,597,697

CLASS 409

134 4,597,698
232 4,597,699
292 4,597,700

CLASS 410

84 4,597,701

CLASS 411

529 4,597,702

CLASS 414

24.6 4,597,703
28 4,597,704
30 4,597,705
4,597,706
62 4,597,707
331 4,597,708
401 4,597,709
409 4,597,710
427 4,597,711
549 4,597,712
690 4,597,713
729 4,597,714

CLASS 416

229 R 4,597,715

CLASS 417

181 4,597,716
265 4,597,717
300 4,597,718
317 4,597,719
368 4,597,720
393 4,597,721
404 4,597,722
440 4,597,723

CLASS 418

55 4,597,724
61 B 4,597,725
201 4,597,726

CLASS 419

23 4,597,938

CLASS 420

429 4,597,939

CLASS 422

32 4,597,940
37 4,597,941
57 4,597,942
70 4,597,943
73 4,597,944
113 4,597,945
190 4,597,946
191 4,597,947
199 4,597,948
249 4,597,949
252 4,597,950

CLASS 423

2 4,597,951
122 4,597,952
132 4,597,953
138 4,597,954
184 4,597,955
328 4,597,956
594 4,597,957
633 4,597,958

CLASS 424

19 4,597,959
28 4,597,960
4,597,961
47 4,597,962
59 4,597,963
70 4,597,964
81 4,597,965
4,598,006
85 4,597,966
88 4,597,967
118 4,597,968
150 4,597,975
157 4,597,969

CLASS 425

12 4,597,727
23 4,597,728
38 4,597,729
78 4,597,730
204 4,597,731

CLASS 426

5 4,597,970
36 4,597,971
4,597,972
93 4,597,973
129 4,597,974
325 4,597,976
482 4,597,977
492 4,597,978
496 4,597,979
568 4,597,980
660 4,597,981

CLASS 427

2 4,597,982
27 4,597,983
28 4,597,984
39 4,597,985
53.1 4,597,986
54.1 4,597,987
4,597,999
97 4,597,988
99 4,597,989
130 4,597,990
140 4,597,992
150 4,597,993
213 4,597,994
214 4,597,991
231 4,597,995
288 4,597,997
386 4,597,996
387 4,597,998

CLASS 428

17 4,598,000
31 4,598,001
36 4,598,002
40 4,598,003
4,598,004
69 4,598,005
116 4,598,007
117 4,598,008
172 4,598,009
4,598,010
221 4,598,011
228 4,598,012
290 4,598,013
323 4,598,014
324 4,598,015
328 4,598,016
336 4,598,017
389 4,598,018
407 4,598,019
411.1 4,598,020
412 4,598,021
413 4,598,022
432 4,598,023
448 4,598,024
450 4,598,025
467 4,598,026
542.8 4,598,027

CLASS 429

30 4,598,028
50 4,598,029

CLASS 430

17 4,598,030
57 4,598,031
58 4,598,032
75 4,598,033
106.6 4,598,034
138 4,598,035
270 4,598,036
281 4,598,037
283 4,598,038
323 4,598,039
405 4,598,040
445 Re.32,195
498 4,598,041

CLASS 431

255 4,597,732
285 4,597,733
328 4,597,734

CLASS 432

11 4,597,735
26 4,597,736
197 4,597,737

CLASS 433

7 4,597,738
16 4,597,739

CLASS 434

20 4,597,740
27 4,597,741

CLASS 435

7 4,598,042
13 4,598,043
28 4,598,044
34 4,598,045
70 4,598,046
108 4,598,047
172.3 4,598,048
287 4,598,049
298 4,598,050

CLASS 436

512 4,598,051

CLASS 440

61 4,597,742

CLASS 446

71 4,597,743
278 4,597,744

CLASS 455

180 4,598,422
4,598,425
191 4,598,423
266 4,598,426
327 4,598,424

CLASS 464

173 4,597,745

CLASS 474

62 4,597,746
227 4,597,747

CLASS 493

29 4,597,748
226 4,597,749
346 4,597,750
403 4,597,751
410 4,597,752

CLASS 501

87 4,598,052
104 4,598,053
112 4,598,054
137 4,598,055

CLASS 502

4 4,598,056
24 4,598,057
183 4,598,058
228 4,598,059
263 4,598,060
303 4,598,061
306 4,598,062
439 4,598,063

CLASS 514

6 4,598,064
12 4,598,065
18 4,598,066
19 4,598,067
25 4,598,068
54 4,598,069
58 4,598,070
79 4,598,071
170 4,598,072
185 4,598,073
196 4,598,074
203 4,598,075
230 4,598,076
233 4,598,077
252 4,598,078
4,598,079
277 4,598,080
296 4,598,081
352 4,598,082
357 4,598,083
374 4,598,084
382 Re.32,196
383 4,598,085
402 4,598,086
429 4,598,087
4,598,088
449 4,598,089
455 4,598,090
492 4,598,091
4,598,092
538 4,598,093
561 4,598,094
632 4,598,095
715 4,598,096
738 4,598,097

CLASS 521

59 4,598,098
77 4,598,099
81 4,598,100
4,598,101
93 4,598,102
126 4,598,103
139 4,598,104

CLASS 523

215 4,598,105
218 4,598,106
351 4,598,107
411 4,598,108
414 4,598,109
446 4,598,110

CLASS 524

40 4,598,111
78 4,598,112
215 4,598,119
291 4,598,113
345 4,598,114
376 4,598,115
398 4,598,116
444 4,598,117
517 4,598,118
591 4,598,120
874 4,598,121

CLASS 525

61 4,598,122
84 4,598,123
86 4,598,124
183 4,598,125
194 4,598,126
229 4,598,127
240 4,598,128
439 4,598,129
4,598,130
440 4,598,131

CLASS 526

142 4,598,132
322 4,598,133

CLASS 528

17 4,598,134
23 4,598,135
56 4,598,136
173 4,598,137
205 4,598,138
215 4,598,140
248 4,598,139
293 4,598,141
295 4,598,142
336 4,598,143
388 4,598,144

CLASS 530

307 4,597,900
328 4,597,901
383 4,597,899

CLASS 536

1.1 4,598,145
6.4 4,598,146

CLASS 544

238 4,598,147
252 4,598,148
319 4,598,149

CLASS 546

152 4,598,150
167 4,598,151
198 4,598,152
229 4,598,153

CLASS 548

194 4,598,154
253 4,598,155
501 4,598,156

CLASS 549

239 4,598,157
394 4,598,158
492 4,598,159

CLASS 558

29 4,597,911
403 4,597,912
436 4,597,913

CLASS 560

144 4,598,160
347 4,597,909
359 4,597,910

CLASS 564

101 4,598,161

CLASS 568

448 4,598,162

CLASS 604

61 4,597,753
96 4,597,755
154 4,597,754
175 4,597,756
256 4,597,758
291 4,597,757
385 4,597,759
397 4,597,760
4,597,761

CLASS 623

1 4,597,762
2 4,597,767
8 4,597,763
10 4,597,764
11 4,597,765
13 4,597,766

CLASSIFICATION OF DESIGNS

D2—	320	284,420		601	284,436		434	284,452		53	284,468	D20—	2	284,484		29	284,500
D3—	30.1	284,421	D7—	16	284,437	D10—	33	284,453		58	284,469		9	284,485		97	284,501
	38	284,422		23	284,438		40	284,454		60	284,470		42	284,486		110	284,502
		284,423		105	284,440		46	284,455		63	284,471	D21—	100	284,487		121	284,503
	39	284,424		106	284,441		103	284,456		68	284,472		109	284,488		122	284,504
	71	284,425		148	284,442		124	284,457		77	284,473		134	284,489		139	284,505
D6—	317	284,426		334	284,443	D11—	158	284,458		100	284,474		136	284,490		150	284,506
	328	284,427		393	284,444	D12—	125	284,459		107	284,475			284,491	D24—	17	284,507
	349	284,428		397	284,445		140	284,460	D15—	28	284,476		143	284,492		21	284,508
	368	284,429	D8—	49	284,446		185	284,461		131	284,477		204	284,493		27	284,510
	450	284,430		331	284,447		189	284,462	D16—	102	284,478		234	284,494		29	284,509
	479	284,431		363	284,448	D13—	9	284,463	D18—	24	284,479		240	284,495	D25—	51	284,511
	494	284,432		385	284,449		24	284,464	D19—	20	284,480	D22—	25	284,496			284,512
		284,433	D9—	70	284,439			284,465		26	284,481		27	284,497		68	284,513
	498	284,434		332	284,450			284,466		90	284,482	D23—	21	284,498		80	284,514
	512	284,435		353	284,451	D14—	52	284,467		91	284,483		25	284,499	D26—	30	284,515

CLASSIFICATION OF PLANTS

P.—	11	5,756		68	5,757			5,758			5,759						

STATUTORY INVENTION REGISTRATIONS

42—	16	H88	73—	12	H86	343—	7.7	H92	356—	33	H76	360—	133	H79	426—	423	H89
	25	H87		56	H93	346—	38	H81	357—	30	H95	376—	280	H91	560—	110	H78
	76 A	H82	222—	95	H80	350—	96.12	H77	358—	140	H84	424—	49	H83	604—	284	H85
66—	192	H90	250—	227	H94												

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

423—	167	T106,801															

GEOGRAPHICAL INDEX

OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 4,597,255
4,597,266
4,597,356
4,597,399
4,597,811
4,597,830
4,597,924
4,597,995
4,598,174
4,598,181
4,598,184
04 : 4,597,230
4,597,273
4,597,362
4,597,487
4,597,538
4,597,675
4,597,712
4,597,857
4,597,883
4,598,011
4,598,170
4,598,212
4,598,213
4,598,260
4,598,266
4,598,268
4,598,359
4,598,365
4,598,372
4,598,404
05 : 4,597,390
4,597,555
06 : 4,597,109
4,597,112
4,597,139
4,597,140
4,597,151
4,597,163
4,597,175
4,597,185
4,597,191
4,597,207
4,597,212
4,597,224
4,597,244
4,597,256
4,597,259
4,597,261
4,597,267
4,597,332
4,597,339
4,597,346

4,597,358
4,597,359
4,597,391
4,597,402
4,597,412
4,597,416
4,597,421
4,597,430
4,597,456
4,597,463
4,597,465
4,597,493
4,597,502
4,597,509
4,597,510
4,597,520
4,597,527
4,597,548
4,597,551
4,597,553
4,597,568
4,597,595
4,597,606
4,597,621
4,597,624
4,597,631
4,597,639
4,597,643
4,597,648
4,597,649
4,597,664
4,597,665
4,597,667
4,597,682
4,597,688
4,597,690
4,597,697
4,597,700
4,597,701
4,597,708
4,597,722
4,597,723
4,597,736
4,597,739
4,597,743
4,597,755
4,597,756
4,597,757
4,597,766
4,597,776
4,597,792
4,597,832
4,597,839

4,597,845
4,597,847
4,597,896
4,597,936
4,597,948
4,597,950
4,597,954
4,597,973
4,597,976
4,597,979
4,597,982
4,597,986
4,597,989
4,597,997
4,598,003
4,598,007
4,598,025
4,598,045
4,598,051
4,598,105
4,598,165
4,598,171
4,598,196
4,598,208
4,598,216
4,598,235
4,598,252
4,598,256
4,598,262
4,598,270
4,598,277
4,598,288
4,598,298
4,598,302
4,598,305
4,598,308
4,598,324
4,598,328
4,598,340
4,598,345
4,598,348
4,598,360
4,598,369
4,598,386
4,598,387
4,598,391
4,598,393
4,598,397
4,598,405
4,598,408
4,598,409
08 : 4,597,360
4,597,403

4,597,425
4,597,433
4,597,626
4,597,852
4,598,245
4,598,326
4,598,418
09 : 4,597,174
4,597,198
4,597,205
4,597,233
4,597,258
4,597,319
4,597,382
4,597,434
4,597,464
4,597,560
4,597,809
4,597,843
4,597,988
4,598,000
4,598,022
4,598,173
4,598,187
4,598,259
4,598,280
4,598,337
4,598,343
4,598,366
4,598,384
4,598,396
10 : 4,597,348
4,597,895
4,597,897
4,597,920
4,598,006
4,598,037
4,598,102
4,598,161
4,598,221
11 : 4,597,873
4,597,947
4,598,210
12 : 4,597,119
4,597,135
4,597,146
4,597,179
4,597,270
4,597,342
4,597,363
4,597,378
4,597,394
4,597,408

4,597,423
4,597,511
4,597,574
4,597,655
4,597,778
4,597,864
4,597,865
4,597,930
4,597,975
4,598,226
4,598,257
4,598,331
4,598,356
13 : 4,597,247
4,597,550
4,597,634
4,597,977
15 : 4,597,681
16 : 4,597,395
17 : 4,597,118
4,597,122
4,597,134
4,597,137
4,597,176
4,597,236
4,597,285
4,597,366
4,597,377
4,597,388
4,597,422
4,597,428
4,597,435
4,597,477
4,597,480
4,597,504
4,597,517
4,597,525
4,597,577
4,597,583
4,597,618
4,597,619
4,597,695
4,597,705
4,597,716
4,597,742
4,597,744
4,597,751
4,597,758
4,597,900
4,597,946
4,597,955
4,597,971
4,598,109

4,598,166
4,598,177
4,598,215
4,598,218
4,598,223
4,598,232
4,598,250
4,598,279
4,598,285
4,598,291
4,598,313
4,598,351
4,598,355
4,598,425
18 : 4,597,149
4,597,209
4,597,623
4,597,684
4,598,021
4,598,117
4,598,129
4,598,217
4,598,423
19 : 4,597,206
4,597,460
4,597,495
4,597,584
4,597,590
4,597,602
4,597,608
4,598,064
4,598,186
4,598,236
20 : 4,597,452
4,597,672
21 : 4,597,427
22 : 4,597,350
4,597,454
4,597,523
4,597,580
4,597,747
4,597,960
4,598,073
4,598,311
23 : 4,597,125
4,597,400
4,597,519
24 : 4,597,120
4,597,173
4,597,203
4,597,213
4,597,299
4,597,516

4,597,782
4,597,903
4,597,933
4,598,012
4,598,047
4,598,153
4,598,179
4,598,294
4,598,367
4,598,411
25 : 4,597,123
4,597,148
4,597,240
4,597,351
4,597,383
4,597,567
4,597,591
4,597,604
4,597,622
4,597,640
4,597,679
4,597,891
4,597,905
4,597,914
4,597,949
4,598,018
4,598,067
4,598,094
4,598,124
4,598,158
4,598,206
4,598,225
4,598,230
4,598,246
4,598,296
4,598,342
4,598,400
26 : 4,597,153
4,597,155
4,597,162
4,597,187
4,597,202
4,597,245
4,597,251
4,597,260
4,597,304
4,597,313
4,597,338
4,597,349
4,597,365
4,597,368
4,597,375
4,597,413
4,597,414
4,597,419
4,597,453
4,597,467
4,597,491
4,597,547
4,597,601
4,597,605
4,597,614
4,597,615
4,597,698
4,597,730
4,597,746
4,597,838
4,597,888
4,597,890
4,597,964
4,598,015
4,598,020
4,598,088
4,598,119
4,598,209
4,598,220

4,598,240
4,598,306
4,598,339
27 : 4,597,130
4,597,131
4,597,415
4,597,476
4,597,754
4,597,765
4,598,049
4,598,139
4,598,198
4,598,251
4,598,276
4,598,322
4,598,329
4,598,333
4,598,357
4,598,381
4,598,414
4,598,420
28 : 4,597,180
4,597,302
4,598,050
29 : 4,597,150
4,597,201
4,597,385
4,597,505
4,597,566
4,597,594
4,597,693
4,597,783
4,598,111
4,598,162
4,598,346
4,598,378
30 : 4,597,121
4,597,834
31 : 4,597,210
4,597,231
4,598,341
32 : 4,597,821
33 : 4,597,195
4,597,652
4,598,248
34 : 4,597,160
4,597,165
4,597,194
4,597,235
4,597,379
4,597,488
4,597,542
4,597,562
4,597,629
4,597,638
4,597,646
4,597,707
4,597,771
4,597,774
4,597,781
4,597,823
4,597,854
4,597,885
4,597,887
4,597,944
4,597,951
4,597,963
4,597,966
4,597,968
4,597,970
4,597,985
4,598,071
4,598,074
4,598,099
4,598,103
4,598,116

4,598,130
4,598,152
4,598,160
4,598,164
4,598,224
4,598,227
4,598,249
4,598,261
4,598,309
4,598,312
4,598,321
4,598,325
4,598,358
4,598,401
4,598,416
35 : 4,597,449
4,597,733
4,597,961
4,598,338
36 : Re.32,195
4,597,115
4,597,117
4,597,263
4,597,281
4,597,322
4,597,328
4,597,337
4,597,354
4,597,397
4,597,471
4,597,494
4,597,498
4,597,549
4,597,570
4,597,571
4,597,620
4,597,625
4,597,628
4,597,630
4,597,653
4,597,654
4,597,676
4,597,749
4,597,750
4,597,767
4,597,772
4,597,773
4,597,801
4,597,803
4,597,814
4,597,822
4,597,825
4,597,934
4,597,959
4,597,981
4,597,996
4,597,998
4,598,027
4,598,030
4,598,082
4,598,098
4,598,100
4,598,101
4,598,104
4,598,107
4,598,112
4,598,122
4,598,135
4,598,140
4,598,145
4,598,238
4,598,292
4,598,295
4,598,364
4,598,390

4,598,406
4,598,415
4,598,422
37 : 4,597,124
4,597,396
4,597,424
4,597,478
4,597,539
4,597,578
4,597,710
4,597,769
4,597,777
4,598,013
4,598,185
4,598,273
4,598,283
4,598,398
39 : 4,597,152
4,597,156
4,597,169
4,597,274
4,597,301
4,597,312
4,597,327
4,597,330
4,597,331
4,597,386
4,597,437
4,597,496
4,597,497
4,597,499
4,597,521
4,597,531
4,597,536
4,597,556
4,597,699
4,597,721
4,597,729
4,597,760
4,597,761
4,597,770
4,597,780
4,597,836
4,597,898
4,597,929
4,597,941
4,597,984
4,598,026
4,598,253
4,598,278
4,598,363
4,598,376
4,598,380
4,598,410
40 : 4,597,183
4,597,234
4,597,702
4,597,855
4,597,859
4,597,874
4,598,128
4,598,353
41 : 4,597,219
4,597,589
4,597,617
4,597,713
4,597,812
4,598,234
4,598,269
4,598,303
4,598,315
4,598,334
42 : 4,597,126
4,597,147
4,597,170

4,597,188
4,597,248
4,597,249
4,597,254
4,597,262
4,597,294
4,597,334
4,597,341
4,597,345
4,597,420
4,597,532
4,597,564
4,597,565
4,597,599
4,597,674
4,597,789
4,597,807
4,597,816
4,597,858
4,597,875
4,597,884
4,597,889
4,597,901
4,597,911
4,597,919
4,597,953
4,598,009
4,598,010
4,598,028
4,598,029
4,598,039
4,598,057
4,598,063
4,598,113
4,598,123
4,598,131
4,598,149
4,598,182
4,598,201
4,598,263
4,598,316
4,598,318
4,598,332
4,598,417
43 : 4,597,384
44 : 4,597,518
4,597,559
4,597,748
4,598,286
45 : 4,597,297
4,597,585
4,597,799
4,598,183
4,598,297
46 : 4,597,324
47 : 4,597,110
4,597,127
4,597,197
4,597,967
4,598,024
4,598,142
4,598,192
4,598,347
48 : 4,597,164
4,597,177
4,597,186
4,597,272
4,597,335
4,597,398
4,597,438
4,597,439
4,597,440
4,597,442
4,597,443
4,597,444

4,597,445
4,597,447
4,597,448
4,597,455
4,597,554
4,597,581
4,597,633
4,597,714
4,597,775
4,597,779
4,597,788
4,597,805
4,597,813
4,597,863
4,597,878
4,597,916
4,597,918
4,597,922
4,597,965
4,597,991
4,598,060
4,598,214
4,598,229
4,598,290
4,598,327
4,598,361
4,598,383
4,598,388
4,598,389
4,598,392
4,598,395
4,598,399
49 : 4,597,575
50 : 4,597,401
4,597,524
4,597,715
51 : 4,597,128
4,597,226
4,597,269
4,597,325
4,597,441
4,597,579
4,597,666
4,597,785
4,597,902
4,597,917
4,598,168
4,598,202
4,598,247
4,598,330
53 : 4,597,196
4,597,215
4,597,282
4,597,432
4,597,573
4,597,876
4,598,272
54 : 4,597,389
55 : 4,597,410
4,597,473
4,597,530
4,597,686
4,597,692
4,597,704
4,597,717
4,597,727
4,597,759
4,597,810
4,597,972
4,598,004
4,598,118
4,598,178
4,598,219
4,598,265
56 : 4,597,204

DESIGN PATENTS

04 :	284,505		284,510	20 :	284,502		284,457		284,471	45 :	284,494
06 :	284,426		284,511	21 :	284,425		284,465		284,488	47 :	284,430
	284,432		284,512	25 :	284,437		284,509	37 :	284,431	48 :	284,428
	284,433	08 :	284,452		284,440	27 :	284,461	39 :	284,447		284,484
	284,436	12 :	284,497		284,480	29 :	284,439		284,458		284,495
	284,441	17 :	284,463		284,493	34 :	284,429	40 :	284,476	53 :	284,513
	284,451		284,487	26 :	284,422		284,464	41 :	284,420	55 :	284,445
	284,455		284,489		284,423	36 :	284,421	42 :	284,456		284,454
	284,462		284,507		284,427		284,424		284,466		284,468
	284,483	19 :	284,515		284,434		284,435		284,514		284,500
	284,499										

PLANT PATENTS

19 :	5,756		5,757	5,758	5,759		

STATUTORY INVENTION REGISTRATIONS

06 :	H77	10 :	H90	H86		H93	H82	36 :	H76
	H80	17 :	H87	H89	25 :	H85	H83	51 :	H94
	H84		H91	H92	34 :	H81	H88		H95
08 :	H79	24 :	H78						

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

01 :	T106,801						

U.S. GOVERNMENT PRINTING OFFICE : O—1986

CHANGE OF ADDRESS FORM

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

SUBSCRIPTION ORDER FORM

SUBSCRIPTION ORDER FORM

ENTER MY SUBSCRIPTION TO:

@ $ Domestic; @ $ Foreign.

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

☐ Remittance Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No. .....

MAIL ORDER FORM TO:
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402

U.S. DEPARTMENT OF COMMERCE
Malcolm Baldrige, *Secretary*
PATENT AND TRADEMARK OFFICE
Donald J. Quigg, *Commissioner*